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SEP 26 2008

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SUBJECT: SITE 14 SOUTH PROGRESS REPORT
FORMER NAVAL AIR STATION MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

Dear Ms. Wells and Ms. Lee:

The final September 26, 2008 *Site 14 South Progress Report* is enclosed for your records. Thank you for your help with the completion of this report. This report describes remedial and groundwater monitoring activities conducted at Site 14 South. The Navy will continue to coordinate with the regulatory agencies throughout the environmental restoration process.

Should you have questions or need additional information, please contact me at (619) 532-0963 or Mr. Wilson Doctor, Remedial Project Manager, at (619) 532-0928.

Sincerely,

A handwritten signature in black ink, appearing to read "Darren Newton", is written over a horizontal line.

DARREN NEWTON
Base Realignment and Closure
Environmental Coordinator
By direction of the Director

Enclosure: 1. Final *Site 14 South Progress Report*

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**Contract No. N62473-06-D-2201
CTO No. 0017**

SITE 14 SOUTH PROGRESS REPORT

September 26, 2008

DCN: ECSD-2201-0017-0007

**FORMER NAVAL AIR STATION MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA**

Base Realignment and Closure
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SITE 14 SOUTH PROGRESS REPORT
September 26, 2008

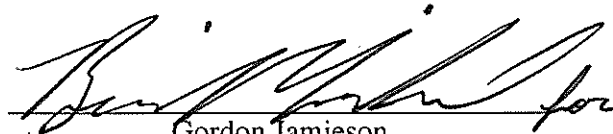
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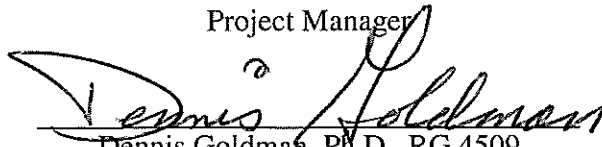


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TABLE OF CONTENTS

TABLE OF CONTENTS.....	i
LIST OF TABLES.....	ii
LIST OF FIGURES	ii
APPENDICES	iii
ABBREVIATIONS AND ACRONYMS	iv
EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1-1
1.1 SITE 14 SOUTH.....	1-1
1.2 PROGRESS REPORT OBJECTIVES	1-2
1.3 REGULATORY FRAMEWORK AND REQUIREMENTS	1-2
1.4 REPORT ORGANIZATION.....	1-3
2.0 IN SITU CHEMICAL OXIDATION	2-1
2.1 OBJECTIVES OF ACTIVITIES	2-1
2.2 ACTIVITIES.....	2-1
2.2.1 Bench-scale Laboratory Treatability Study.....	2-1
2.2.2 Modified Fenton’s Reagent	2-1
2.2.3 Field Activities	2-2
2.3 RESULTS OF ACTIVITIES	2-3
3.0 GROUNDWATER MONITORING	3-1
3.1 OBJECTIVE OF ACTIVITIES	3-1
3.2 ACTIVITIES.....	3-1
3.2.1 Potentiometric Surface at Site 14 South.....	3-1
3.2.2 Baseline Groundwater Sampling	3-1
3.2.3 Quarterly Post-injection Groundwater Sampling	3-2
3.3 RESULTS OF ACTIVITIES	3-3
3.3.1 Baseline Groundwater Sampling.....	3-3
3.3.2 Round 1 Post-injection Groundwater Sampling.....	3-4
3.3.3 Round 2 Post-injection Groundwater Sampling.....	3-5
3.3.4 Round 3 Post-injection Groundwater Sampling.....	3-6
3.3.5 Round 4 Post-injection Groundwater Sampling.....	3-7
3.4 EFFECTIVENESS OF MODIFIED FENTON’S REAGENT	3-8
3.5 CONCLUSIONS.....	3-10
4.0 REFERENCES	4-1

LIST OF TABLES

	FOLLOWING PAGE
Table 1-1	Moffett Environmental Screening Levels for Petroleum Constituents..... 1-2
Table 2-1	Summary of Injection Point Volumes and Flow Rates..... 2-4
Table 2-2	Groundwater Quality Data During Injection 2-4
Table 3-1	Groundwater Elevations..... 3-4
Table 3-2	Summary of Groundwater Analytical Results, Potential Future Use Scenario3-4
Table 3-3	Cation/Anion Balance in Site 14 South Groundwater 3-8

LIST OF FIGURES

	FOLLOWING PAGE
Figure 1-1	Regional Location Map..... 1-2
Figure 1-2	Site Location Map..... 1-2
Figure 2-1	Site Map with Injection Point Locations 2-2
Figure 3-1	Monitoring Locations for Groundwater Sampling 3-2
Figure 3-2	Potentiometric Surface Map, January 2005 3-4
Figure 3-3	Potentiometric Surface Map, April 2005 3-4
Figure 3-4	Potentiometric Surface Map, July 2005..... 3-4
Figure 3-5	Potentiometric Surface Map, October 2005..... 3-4
Figure 3-6	Potentiometric Surface Map, January 2006 3-4
Figure 3-7	Extent of Plumes in Groundwater, Baseline (January 2005)..... 3-4
Figure 3-8	Extent of Plumes in Groundwater, Round 1 (April 2005)..... 3-4

Figure 3-9	Extent of Plumes in Groundwater, Round 2 (July 2005).....	3-6
Figure 3-10	Extent of Plumes in Groundwater, Round 3 (October 2005).....	3-6
Figure 3-11	Piper Diagram	3-8
Figure 3-12	Extent of Plume in Groundwater, Round 4 (January 2006).....	3-8
Figure 3-13	Time Series Concentrations of Benzene and TPH-gas, ERM-3	3-10
Figure 3-14	Time Series Concentrations of Benzene and TPH-gas, W14-11	3-10
Figure 3-15	Time Series Concentrations of Benzene and TPH-gas, W14-2.....	3-10
Figure 3-16	Time Series Concentrations of Xylene, W14-2	3-10

APPENDICES

Appendix A	Project Photographs
Appendix B	Bench-Scale Laboratory Treatability Study
Appendix C	Survey Report of Injection Points
Appendix D	Groundwater Sampling Data Sheets (Provided on CD only)
Appendix E	Laboratory Analytical Data Packages (Provided on CD only)

ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Corrective Action Plan and Associated Work Plan
CCR	California Code of Regulations
COC	chemical of concern
DPT	direct-push technology
EPA	U.S. Environmental Protection Agency
ESL	environmental screening level
ft/ft	feet per foot
HDPE	high-density polyethylene
ISCO	in situ chemical oxidation
ISOTEC	In-Situ Oxidative Technology, Inc.
L/min	liters per minute
meq/L	milliequivalents per liter
MTBE	methyl tert-butyl ether
NASA	National Aeronautics and Space Administration
ORC [®]	Advanced Oxygen Release Compound
TPH	total petroleum hydrocarbons
TPH-gas	total purgeable petroleum hydrocarbons quantified as gasoline
TPH-purgeable	total purgeable petroleum hydrocarbons
TtFW	Tetra Tech FW, Inc.
UST	underground storage tank
Water Board	San Francisco Bay Regional Water Quality Control Board
WATS	West-Side Aquifers Treatment System

EXECUTIVE SUMMARY

As part of the underground storage tank program, the Navy is conducting environmental restoration activities at the former Naval Air Station Moffett Field (Moffett), Moffett Field, California. Coordination of the activities involves the Navy, National Aeronautics and Space Administration, U.S. Environmental Protection Agency, and the San Francisco Bay Regional Water Quality Control Board. This Progress Report follows and is compliant with the requirements of the California Code of Regulations Title 23, Division 3, Chapter 16, Article 11.

The *Final Site 14 South Corrective Action Plan and Associated Work Plan* (CAP) (Tetra Tech FW, Inc. [TtFW], 2004a) detailed bioremediation via in situ injection of Advanced Oxygen Release Compound (ORC[®]) as the selected remedy. However, based on pre-remedial design data collection, it was determined that petroleum contaminant concentrations and the volume of contaminated soil were greater than estimated when evaluating the proposed remedial alternatives. The use of Advanced ORC[®] was determined to be impractical.

A modification to the approved CAP (TtFW, 2004a) recommended the use of modified Fenton's Reagent as a chemical oxidant. In accordance with the *Addendum to the Site 14 South Corrective Action Plan and Associated Work Plan* (Addendum to the CAP) (TtFW, 2004b), the alternative remedial approach was detailed to meet the objective of reducing peak petroleum concentrations prior to implementing natural attenuation monitoring. In January 2005, in situ chemical oxidation (ISCO) by injection of modified Fenton's Reagent was implemented as the remedial action. Approximately 9,770 gallons of hydrogen peroxide and 4,820 gallons of catalyst, for a total of 14,590 gallons of modified Fenton's Reagent, were injected into 30 hand-auger points.

In accordance with the groundwater monitoring program, a baseline groundwater sampling event was conducted prior to reagent injection. Baseline groundwater sampling was completed during January 2005. Four rounds of groundwater sampling were conducted on a quarterly basis after reagent injection. Rounds 1 through 4 were completed in April 2005, July 2005, October 2005, and January 2006, respectively.

Groundwater sampling data continue to demonstrate that there is no upgradient source(s) of petroleum hydrocarbons contributing to the soil/groundwater contamination found at Site 14 South.

According to bench scale testing, sustained reductions in groundwater petroleum hydrocarbon concentrations were expected after the initial Fenton's Reagent injection. Up to three injection events were originally planned to account for continued soil desorption and groundwater chemical rebound that was likely to occur after the initial injection event. Significant reductions of petroleum hydrocarbon concentrations were observed in round 1 sampling compared to pre-

injection concentrations. However, by post-injection sampling round 2 and 3, total purgeable petroleum hydrocarbons quantified as gasoline (TPH-gas) and xylene concentrations had rebounded to levels equal to or greater than pre-injection concentrations. Based on the greater than expected rebound of TPH-gas and xylene concentrations, additional Fenton's Reagent injections events were not completed as originally planned. ISCO using Fenton's Reagent did not achieve results similar to bench scale tests and thus was likely to be ineffective at achieving project objectives. Additional corrective action is required to reduce the petroleum contamination at Site 14 South. The Navy is conducting additional actions at Site 14 South according to the final *Addendum No. 2 to Site 14 South Corrective Action Plan and Associated Work Plan for Underground Storage Tank Integrity Testing and Additional Site Assessment* (Battelle, 2008).

1.0 INTRODUCTION

As part of the underground storage tank (UST) program, the Navy is conducting environmental restoration activities at the former Naval Air Station Moffett Field (Moffett), Moffett Field, California (Figure 1-1). Coordination of the activities involves the Navy, National Aeronautics and Space Administration (NASA), U.S. Environmental Protection Agency (EPA), and the San Francisco Bay Regional Water Quality Control Board (Water Board). This Progress Report follows and is compliant with the requirements of the California Code of Regulations (CCR) Title 23, Division 3, Chapter 16, Article 11.

This Progress Report has been prepared on behalf of the Navy's Base Realignment and Closure Program Management Office West. The fieldwork was conducted under Contract Task Order No. 0086, issued under Remedial Action Contract No. N68711-98-D-5713. This report was completed under Contract Task Order No. 0017, issued under Remedial Action Contract No. N62473-06-D-2201.

1.1 SITE 14 SOUTH

Site 14 South is an unmanned, self-service fuel station located southwest of the intersection of Cody Road and Ellis Street at Moffett (Figure 1-2). The site is currently used as a motor vehicle refueling facility and contains two fuel dispenser islands, a small, rarely occupied attendant building (Building 161), and two 12,000-gallon, double-walled, fiberglass USTs (Tank 70, containing unleaded gasoline, and Tank 71, containing diesel fuel). The site encompasses approximately 1 acre and is almost entirely paved with asphalt or concrete.

The site previously contained two 5,000-gallon USTs (Tanks 19 and 20), which were removed in 1986. Tanks 19 and 20 were reportedly used to store unleaded gasoline and diesel fuel, respectively. A release was originally detected in the excavation when Tanks 19 and 20 were replaced in 1986. The two new USTs (Tanks 70 and 71) were installed adjacent to the location of the former USTs. The new USTs were connected to the fuel dispensers with new product lines in a secondary containment trench. The newly replaced product piping was later removed and replaced with double-walled fiberglass piping in the late 1990s to early 2000. The new USTs and piping systems are active today (Tetra Tech FW, Inc. [TtFW], 2004a).

The *Final Site 14 South Corrective Action Plan and Associated Work Plan* (CAP) (TtFW, 2004a) detailed bioremediation via in situ injection of Advanced Oxygen Release Compound (ORC[®]) as the selected remedy. However, based on pre-remedial design data collection, it was determined that petroleum contaminant concentrations and the volume of contaminated soil were greater than estimated when evaluating the proposed remedial alternatives. The use of Advanced ORC[®] was determined to be impractical.

A modification to the approved CAP (TtFW, 2004a) recommended the use of modified Fenton's Reagent as a chemical oxidant. In accordance with the *Addendum to the Site 14 South Corrective Action Plan and Associated Work Plan* (Addendum to the CAP) (TtFW, 2004b), the alternative remedial approach was detailed to meet the objective of reducing peak petroleum concentrations prior to implementing natural attenuation monitoring. In January 2005, in situ chemical oxidation (ISCO) by injection of modified Fenton's Reagent was implemented as the remedial action.

In accordance with the groundwater monitoring program, a baseline groundwater sampling event was conducted prior to reagent injection. Four rounds of groundwater sampling were conducted on a quarterly basis after reagent injection.

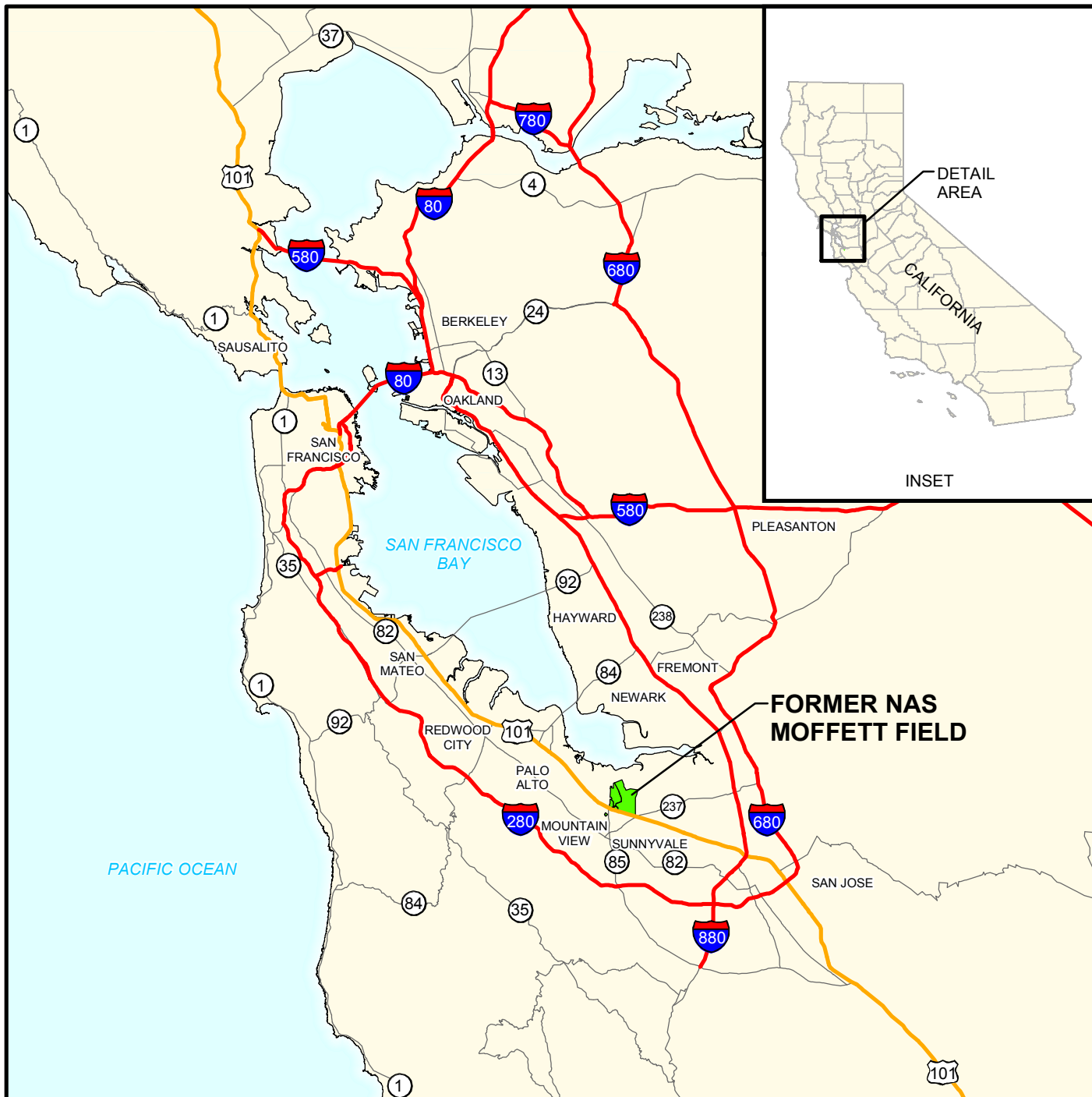
1.2 PROGRESS REPORT OBJECTIVES

This Progress Report summarizes the results of the ISCO activities and the findings of the subsequent groundwater monitoring program conducted in accordance with the CAP (TtFW, 2004a) and the Addendum to the CAP (TtFW, 2004b). Project photographs of field activities are provided in Appendix A.






1.3 REGULATORY FRAMEWORK AND REQUIREMENTS

Remedial activities at Moffett are conducted as part of the Installation Restoration Program established by the Department of Defense to identify, evaluate, and control the spread of contaminants from historical hazardous waste sites. Petroleum sites at Moffett are evaluated under the policies and guidance of the Water Board. Evaluation and closure of petroleum sites follow the requirements in CCR Title 23, Division 3, Chapter 16, and the *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites* (Water Board, 1990). The Water Board ultimately grants site closure.

The action levels for Moffett petroleum chemicals of concern were updated in December 2003. Since the USTs at Site 14 South are regulated by the Water Board, the most recent update of the Water Board guidance, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* (Water Board, 2008), was adopted. The former and updated action levels for petroleum constituents in soil and groundwater are summarized in Table 1-1. The former action levels (1994 Consensus Action Levels) were revised to the Environmental Screening Levels (ESLs) for groundwater that is a current or potential source of drinking water (Table F1-a of the May 2008 Interim Final ESLs) following discussions with the Water Board. Consensus was reached by the Water Board and the Navy to update the ESLs. Therefore, the current and applicable action levels for Site 14 South are referred to as ESLs in this Progress Report.



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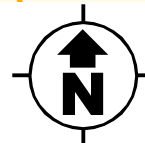
-  STATE HIGHWAY
-  US HIGHWAY
-  INTERSTATE HIGHWAY
-  FORMER NAS MOFFETT FIELD
-  WATER

NOTES:

NAS - NAVAL AIR STATION

5 0 5 10
Miles

Scale: 1" = 10 Miles



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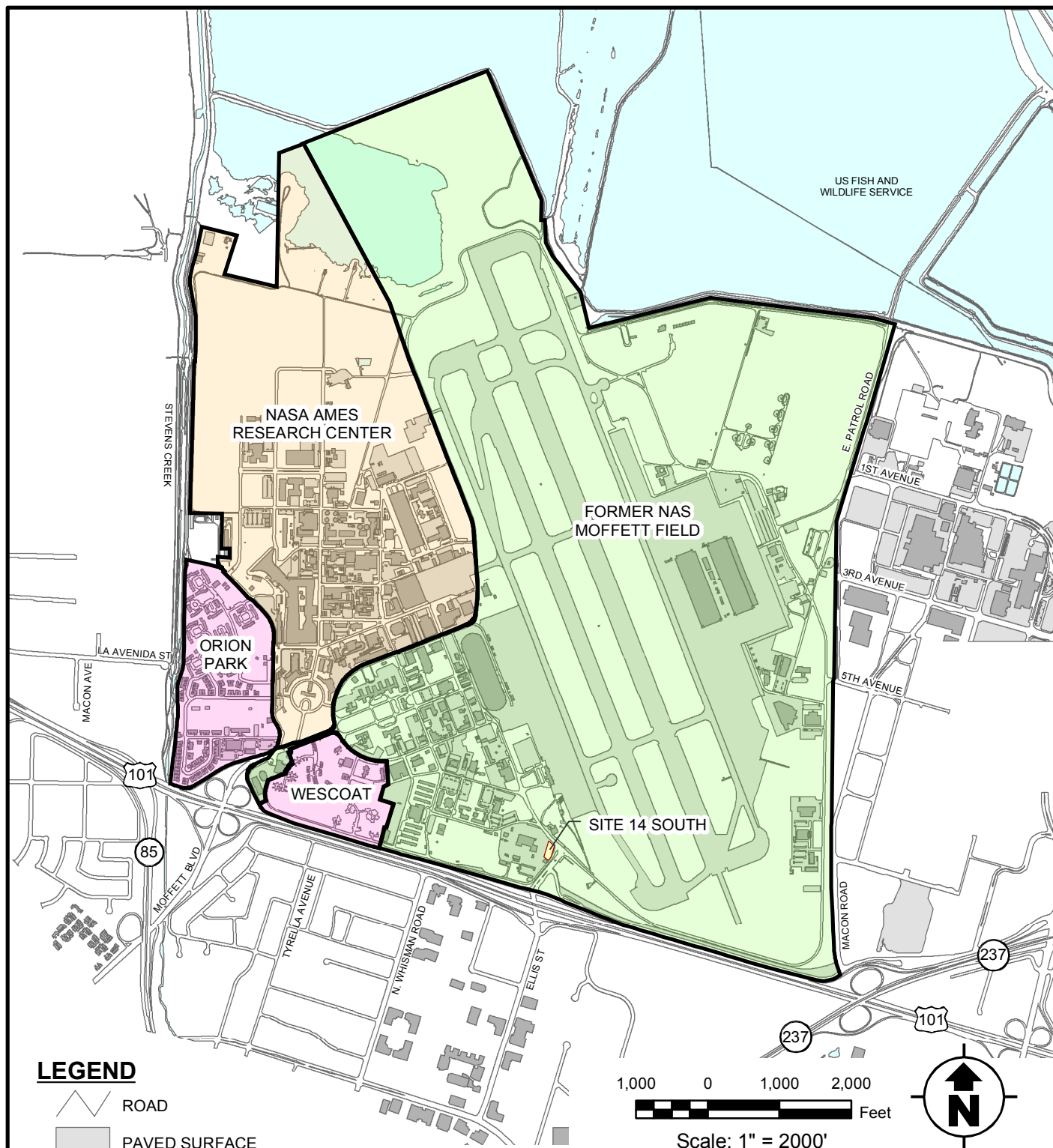
SITE 14 SOUTH PROGRESS REPORT
FIGURE 1-1

REGIONAL LOCATION MAP
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA








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LEGEND

-  ROAD
-  PAVED SURFACE
-  BUILDING
-  WATER
-  FORMER NAS MOFFETT FIELD
-  NASA AMES RESEARCH CENTER
-  MOFFETT COMMUNITY HOUSING

SOURCE: RECORD OF SURVEY FORMER NAS MOFFETT FIELD, MARCH 2000, NASA.

BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST SAN DIEGO, CA

SITE 14 SOUTH PROGRESS REPORT

FIGURE 1-2

SITE LOCATION MAP

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CA

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TETRA TECH EC, INC.

SITE 14 SOUTH PROGRESS REPORT

TABLE 1-1

MOFFETT ENVIRONMENTAL SCREENING LEVELS FOR PETROLEUM CONSTITUENTS

Constituent	Former Soil Action Level ^a (mg/kg)	Former Groundwater Action Level ^a (µg/L)	ESLs ^b - Deep Soils (>3 m bgs) Groundwater IS a Current or Potential Source of Drinking Water		ESLs ^b - Shallow Soils (<3 m bgs) Groundwater IS a Current or Potential Source of Drinking Water	
			Deep Soil Commercial Industrial Land Use Only (mg/kg)	Groundwater (µg/L)	Shallow Soil Commercial Industrial Land Use Only (mg/kg)	Groundwater (µg/L)
Benzene	4	1	0.044	1	0.044	1
Toluene	2,700	680	2.9	40	2.9	40
Ethylbenzene	3,100	1,000	3.3	30	3.3	30
Xylene	980	1,750	2.3	20	2.3	20
MTBE	N/A	13	0.023	5	0.023	5
Lead	1,000	3	7,500	2.5	7,500	2.5
Benzo[a]pyrene	N/A	N/A	1.5	0.014	0.13	0.014
Naphthalene	4	20	3.4	17	2.8	17
TPH-p as gas	150	50	83	100	83	100
TPH-e as diesel	400	700	83	100	83	100
TPH-e as JP5 ^c	400	700	83	100	83	100

Notes:

^a Former action levels (1994 Concensus Action Levels) were revised to the ESLs following a December 8, 2003, conference call with the Water Board, NASA, Navy and TtEC.

^b May 2008, Interim Final ESLs

^c No ESL action level is specified for TPH-e as JP5. The action level for TPH-e as diesel was used for corresponding deep soil, shallow soil, and groundwater action levels for TPH-e as JP5.

Abbreviations and Acronyms:

µg/L - micrograms per liter
 m bgs - meters below ground surface
 ESL - environmental screening level
 JP5 - jet petroleum 5
 mg/kg - milligrams per kilogram
 MTBE - methyl tert-butyl ether

N/A - not applicable
 NASA - National Aeronautics and Space Administration
 TPH-e - total extractable petroleum hydrocarbons
 TPH-p - total purgeable petroleum hydrocarbons
 TtEC - Tetra Tech EC, Inc.

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1.4 REPORT ORGANIZATION

This report is organized as follows:

Section 1.0 provides a description of Site 14 South, the report objectives, the regulatory framework, and report organization.

Section 2.0 provides a description of the ISCO activities performed at Site 14 South.

Section 3.0 provides details of the groundwater monitoring program associated with the chemical oxidation activities.

Section 4.0 lists the references cited in this report.

Tables and Figures are included with the text.

Appendix A includes the project photographs.

Appendix B includes the bench-scale laboratory treatability study.

Appendix C includes a survey report of the injection points.

Appendix D includes the groundwater sampling data sheets.

Appendix E includes laboratory analytical data packages.

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2.0 IN SITU CHEMICAL OXIDATION

This section provides a summary of the objectives, activities, and results of activities that are associated with the in situ chemical oxidation (ISCO) that was conducted as part of the implementation of the *Final Site 14 South Corrective Action Plan and Associated Work Plan* (CAP) (Tetra Tech FW, Inc. [TtFW], 2004a) and *Addendum to the Site 14 South Corrective Action Plan and Associated Work Plan* (Addendum to the CAP) (TtFW, 2004b).

2.1 OBJECTIVES OF ACTIVITIES

The objective of ISCO was to reduce petroleum contaminant concentrations to below the environmental screening levels and obtain site closure at Site 14 South.

2.2 ACTIVITIES

The activities associated with the ISCO were:

- Conducting a bench-scale laboratory treatability study (treatability study)
- Locating utilities
- Injecting modified Fenton's Reagent using a direct-push technology (DPT) rig
- Site restoration and surveying

All field activities were completed in accordance with the CAP (TtFW, 2004a) and the Addendum to the CAP (TtFW, 2004b).

2.2.1 Bench-scale Laboratory Treatability Study

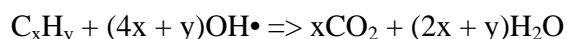
In-Situ Oxidative Technologies, Inc. (ISOTEC) supplied the materials and the expertise to complete the injection of the modified Fenton's Reagent. Prior to the injection event, a treatability study was conducted using soil samples collected in June 2004 and groundwater samples collected in August 2004 from Site 14 South. The treatability study was designed to determine the site-specific stoichiometry and catalyst ratios required to oxidize the petroleum contaminants.

2.2.2 Modified Fenton's Reagent

The modified Fenton's Reagent process reduces petroleum contamination through chemical oxidation and reduction reactions. The process consists of injecting chelated iron catalysts (iron sulfate salts) and stabilized hydrogen peroxide into the contaminated subsurface at a neutral pH. Hydroxyl free radicals are generated when the iron catalyst reacts with hydrogen peroxide. The

hydroxyl free radicals react with the petroleum contamination to produce carbon dioxide and water.

The principal chemical reaction associated with modified Fenton's Reagent is:



where: H_2O_2 = hydrogen peroxide

Fe^{2+} = ferrous ion

$\text{OH}\bullet$ = hydroxyl radicals

Fe^{3+} = ferric ion

C_xH_y = petroleum contamination

CO_2 = carbon dioxide

H_2O = water

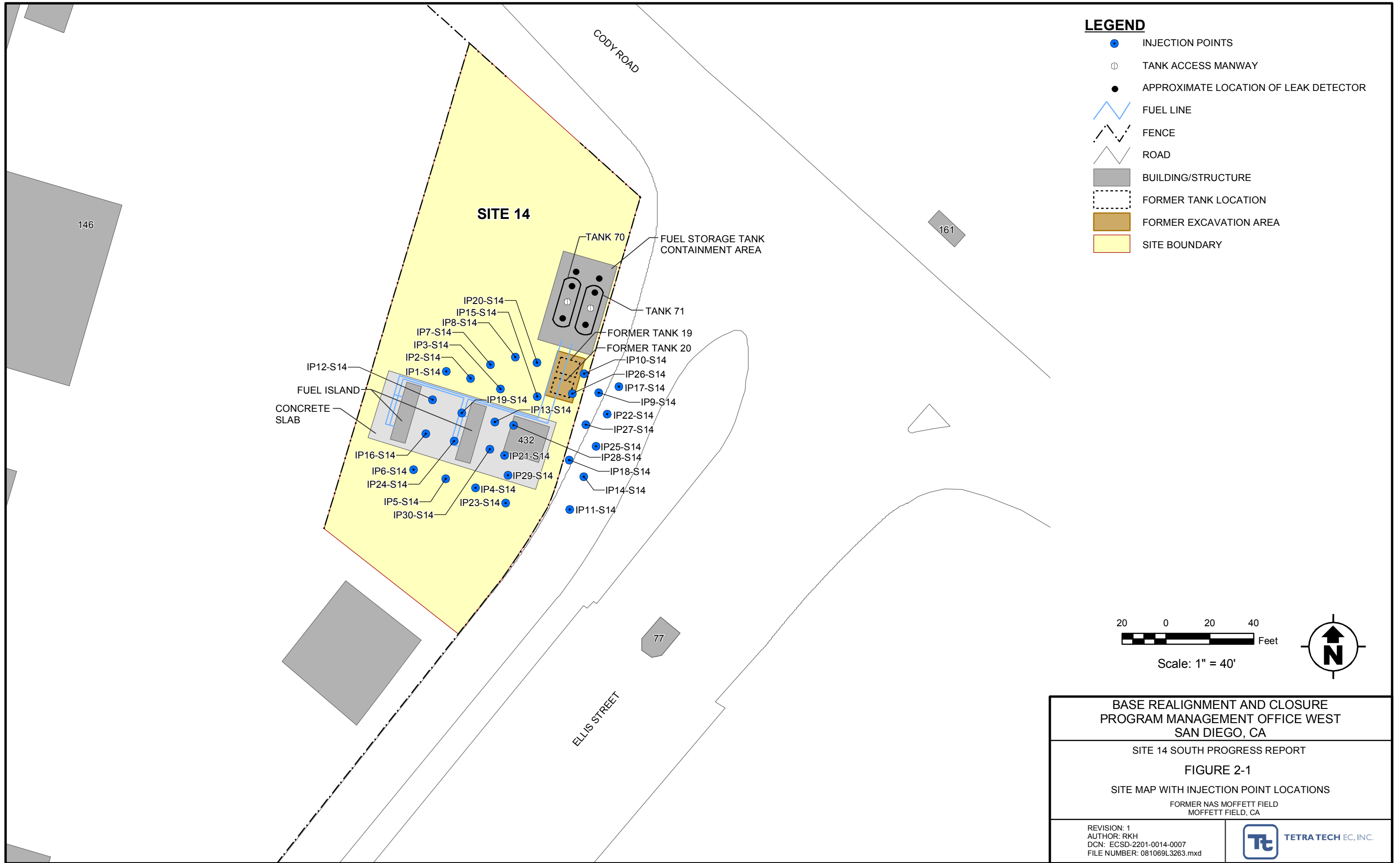
The process involves injecting low concentration, stabilized reagents under slight pressure with constant off-gas release through the injection apparatus. Hydrogen peroxide is typically injected at concentrations of 8 to 12 percent by weight. The iron catalyst is injected at levels comparable to that of naturally occurring iron within the soil matrix.

Additional information regarding modified Fenton's Reagent is provided in the CAP (TtFW, 2004a) and the Addendum to the CAP (TtFW, 2004b).

2.2.3 Field Activities

Underground Service Alert was notified, a geophysical survey was performed to locate the underground utilities, and each injection point was cleared by hand-augering to 5 feet below ground surface (bgs). Injection of modified Fenton's Reagent began on January 18 and was completed on January 26, 2005.

Under consultation from ISOTEC, the impacted soil area was treated using an approximate grid configuration to ensure coverage of the impacted area. Some injection point locations were moved to accommodate site conditions (such as underground utilities, refusal, buildings). The reagent was injected into DPT borings on approximately 15-foot centers with a sufficient buffer from the active underground storage tanks (Figure 2-1). In order to treat the contamination to its maximum depth of 32 feet bgs, injections were completed at three distinct pre-determined depth intervals (9.5 to 14.5 feet bgs, 17 to 22 feet bgs, and 24 to 32 feet bgs) at each injection point as specified by the Addendum to the CAP (TtFW, 2004b).



The procedure for injecting the reagent began with driving a DPT probe with a machined screen end to the injection depth. Once the probe reached the first interval (9.5 to 14.5 feet bgs), up to 180 gallons of reagent was injected through the screened interval. Subsequent injection intervals were advanced in the same DPT boring using the same procedure. The amount of reagent injected at each interval was recorded by visually monitoring the reagent holding tanks. After the reagent was injected at each interval, the DPT probe and injection apparatus were left in place to allow sufficient time for off-gassing of carbon dioxide created during the chemical reaction. Once pressures were reduced, the DPT probe and injection apparatus were removed and the borehole was tremie-filled with neat cement grout. After the grout set for at least 24 hours, the surface at each borehole location was restored to pre-injection conditions (concrete or asphalt).

The DPT probes were decontaminated at the end of each day using a steam cleaner and/or by washing with a nonphosphate detergent. The associated rinse water was placed in 55-gallon steel drums for disposal by processing through the West-Side Aquifers Treatment System. Following completion of injection at all DPTs, a land survey was performed by a California-registered Professional Land Surveyor to establish the horizontal and vertical coordinates for all injection points.

2.3 RESULTS OF ACTIVITIES

Appendix A contains photographs of field activities.

Results of the treatability study provided in Appendix B indicated that effective treatment and significant contaminant destruction were achieved in both groundwater and slurry laboratory samples. The treatability study indicated that modified Fenton's process is effective in treating the site contamination and that 180 gallons (120 gallons as hydrogen peroxide and 60 gallons as iron catalyst) of reagent were necessary for each injection point interval.

Approximately 9,770 gallons of hydrogen peroxide and 4,820 gallons of catalyst, for a total of 14,590 gallons of modified Fenton's Reagent, were injected into 30 points. Table 2-1 presents the injection depths, volumes, and flow rates of the reagents injected at each point and depth interval. The reagent could not be injected to the total depth at four locations (IP11-S14, IP14-S14, IP18-S14, and IP27-S14) because the fine-grained soils limited the amount of fluid acceptance (see Table 2-1). Appendix C contains the survey report for the 30 injection locations.

Water quality parameters of the groundwater were monitored at existing monitoring wells during the injection event. Table 2-2 presents the conductivity, oxidation-reduction potential, pH, temperature, total dissolved solids, dissolved iron, and hydrogen peroxide concentrations measured at wells ERM-1, ERM-3, W14-1, and W14-2.

Evaluation of the effectiveness of ISCO using modified Fenton's Reagent is provided in Section 3.0.

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TABLE 2-1

SUMMARY OF INJECTION POINT VOLUMES AND FLOW RATES

Injection Point ID	Injection Date	Injection Depth (ft bgs)	Catalyst Volume (gal)	Oxidizer Volume (gal)	Catalyst Injection Time (min)	Oxidizer Injection Time (min)	Catalyst Flow Rate (gpm)	Oxidizer Flow Rate (gpm)
IP1-S14	18-Jan-05	9.5 - 14.5	60	120	16	35	3.75	3.43
	18-Jan-05	17 - 22	60	120	10	20	6.00	6.00
	19-Jan-05	24 - 32	60	120	17	29	3.53	4.14
IP2-S14	18-Jan-05	9.5 - 14.5	60	120	12	27	5.00	4.44
	18-Jan-05	17 - 22	60	120	13	28	4.62	4.29
	18-Jan-05	24 - 32	60	120	11	18	5.45	6.67
IP3-S14	18-Jan-05	9.5 - 14.5	60	120	12	36	5.00	3.33
	18-Jan-05	17 - 22	60	120	16	40	3.75	3.00
	18-Jan-05	24 - 32	60	120	11	35	5.45	3.43
IP4-S14	18-Jan-05	9.5 - 14.5	60	120	15	39	4.00	3.08
	18-Jan-05	17 - 22	60	120	25	65	2.40	1.85
	19-Jan-05	24 - 32	60	120	12	31	5.00	3.87
IP5-S14	18-Jan-05	9.5 - 14.5	60	120	11	42	5.45	2.86
	19-Jan-05	17 - 22	60	120	19	32	3.16	3.75
	19-Jan-05	24 - 32	60	120	18	57	3.33	2.11
IP6-S14	18-Jan-05	9.5 - 14.5	60	120	24	36	2.50	3.33
	19-Jan-05	17 - 22	60	120	11	28	5.45	4.29
	19-Jan-05	24 - 32	60	120	15	54	4.00	2.22
IP7-S14	19-Jan-05	9.5 - 14.5	60	120	11	28	5.45	4.29
	19-Jan-05	17 - 22	60	120	16	26	3.75	4.62
	20-Jan-05	24 - 32	60	120	20	28	3.00	4.29
IP8-S14	19-Jan-05	9.5 - 14.5	60	120	12	21	5.00	5.71
	19-Jan-05	17 - 22	60	120	10	25	6.00	4.80
	20-Jan-05	24 - 32	60	120	11	33	5.45	3.64
IP9-S14	19-Jan-05	9.5 - 14.5	60	120	16	35	3.75	3.43
	20-Jan-05	17 - 22	60	120	17	27	3.53	4.44
	20-Jan-05	24 - 32	60	120	12	32	5.00	3.75
IP10-S14	19-Jan-05	9.5 - 14.5	60	120	17	19	3.53	6.32
	20-Jan-05	17 - 22	60	120	24	31	2.50	3.87
	21-Jan-05	24 - 32	60	120	14	27	4.29	4.44
IP11-S14	19-Jan-05	9.5 - 14.5	60	120	11	18	5.45	6.67
	20-Jan-05	17 - 22	0	60	-	19	-	3.16
	N/A	24 - 32	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 2-1

SUMMARY OF INJECTION POINT VOLUMES AND FLOW RATES

Injection Point ID	Injection Date	Injection Depth (ft bgs)	Catalyst Volume (gal)	Oxidizer Volume (gal)	Catalyst Injection Time (min)	Oxidizer Injection Time (min)	Catalyst Flow Rate (gpm)	Oxidizer Flow Rate (gpm)
IP12-S14	20-Jan-05	9.5 - 14.5	60	120	10	25	6.00	4.80
	20-Jan-05	17 - 22	60	120	8	35	7.50	3.43
	20-Jan-05	24 - 32	60	120	21	33	2.86	3.64
IP13-S14	20-Jan-05	9.5 - 14.5	60	120	13	27	4.62	4.44
	20-Jan-05	17 - 22	60	120	23	37	2.61	3.24
	21-Jan-05	24 - 32	60	120	16	26	3.75	4.62
IP14-S14	20-Jan-05	9.5 - 14.5	60	120	22	62	2.73	1.94
	21-Jan-05	17 - 22	0	60	-	15	-	4.00
	N/A	24 - 32	N/A	N/A	N/A	N/A	N/A	N/A
IP15-S14	20-Jan-05	9.5 - 14.5	60	120	18	29	3.33	4.14
	21-Jan-05	17 - 22	60	120	14	22	4.29	5.45
	21-Jan-05	24 - 32	60	120	21	31	2.86	3.87
IP16-S14	21-Jan-05	9.5 - 14.5	60	120	11	22	5.45	5.45
	21-Jan-05	17 - 22	60	120	11	19	5.45	6.32
	21-Jan-05	24 - 32	60	120	9	31	6.67	3.87
IP17-S14	21-Jan-05	9.5 - 14.5	60	120	15	27	4.00	4.44
	25-Jan-05	17 - 22	60	120	23	34	2.61	3.53
	25-Jan-05	24 - 32	60	120	19	34	3.16	3.53
IP18-S14	21-Jan-05	9.5 - 14.5	20	30	18	17	1.11	1.76
	N/A	17 - 22	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	24 - 32	N/A	N/A	N/A	N/A	N/A	N/A
IP19-S14	21-Jan-05	9.5 - 14.5	60	120	14	30	4.29	4.00
	24-Jan-05	17 - 22	60	120	19	38	3.16	3.16
	24-Jan-05	24 - 32	60	120	16	41	3.75	2.93
IP20-S14	21-Jan-05	9.5 - 14.5	60	120	17	35	3.53	3.43
	24-Jan-05	17 - 22	60	120	10	24	6.00	5.00
	24-Jan-05	24 - 32	60	120	14	63	4.29	1.90
IP21-S14	24-Jan-05	9.5 - 14.5	60	120	16	37	3.75	3.24
	24-Jan-05	17 - 22	60	120	14	31	4.29	3.87
	26-Jan-05	24 - 32	60	120	28	46	2.14	2.61
IP22-S14	24-Jan-05	9.5 - 14.5	60	120	16	33	3.75	3.64
	24-Jan-05	17 - 22	60	120	18	36	3.33	3.33
	26-Jan-05	24 - 32	60	120	13	24	4.62	5.00

TABLE 2-1

SUMMARY OF INJECTION POINT VOLUMES AND FLOW RATES

Injection Point ID	Injection Date	Injection Depth (ft bgs)	Catalyst Volume (gal)	Oxidizer Volume (gal)	Catalyst Injection Time (min)	Oxidizer Injection Time (min)	Catalyst Flow Rate (gpm)	Oxidizer Flow Rate (gpm)
IP23-S14	24-Jan-05	9.5 - 14.5	60	120	12	25	5.00	4.80
	24-Jan-05	17 - 22	60	120	19	37	3.16	3.24
	25-Jan-05	24 - 32	60	120	15	26	4.00	4.62
IP24-S14	24-Jan-05	9.5 - 14.5	60	120	24	42	2.50	2.86
	25-Jan-05	17 - 22	60	120	17	34	3.53	3.53
	25-Jan-05	24 - 32	60	120	22	37	2.73	3.24
IP25-S14	24-Jan-05	9.5 - 14.5	60	120	30	46	2.00	2.61
	25-Jan-05	17 - 22	60	120	21	30	2.86	4.00
	26-Jan-05	24 - 32	60	120	9	33	6.67	3.64
IP26-S14	24-Jan-05	9.5 - 14.5	60	120	19	27	3.16	4.44
	25-Jan-05	17 - 22	60	120	11	24	5.45	5.00
	25-Jan-05	24 - 32	60	120	19	41	3.16	2.93
IP27-S14	25-Jan-05	9.5 - 14.5	0	20	-	10	-	2.00
	N/A	17 - 22	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	24 - 32	N/A	N/A	N/A	N/A	N/A	N/A
IP28-S14	25-Jan-05	9.5 - 14.5	60	120	19	33	3.16	3.64
	25-Jan-05	17 - 22	60	120	29	35	2.07	3.43
	26-Jan-05	24 - 32	60	120	24	47	2.50	2.55
IP29-S14	25-Jan-05	9.5 - 14.5	60	120	21	49	2.86	2.45
	26-Jan-05	17 - 22	60	120	19	35	3.16	3.43
	26-Jan-05	24 - 32	60	120	22	49	2.73	2.45
IP30-S14	25-Jan-05	9.5 - 14.5	60	120	21	34	2.86	3.53
	26-Jan-05	17 - 22	60	120	25	41	2.40	2.93
	26-Jan-05	24 - 32	60	120	16	32	3.75	3.75
Totals			4820	9770	Average Flow Rates		3.95	3.80

Notes:

Oxidizer is 12% stabilized hydrogen peroxide

Catalyst is ISOTEC series Cat-4260 chelated iron complex

Abbreviations and Acronyms:

bgs - below ground surface

ft - feet

gal - gallon

gpm - gallons per minute

ISOTEC - In-Situ Oxidative Technology, Inc.

min - minute

N/A - This interval was not attempted due to surfacing of reagents in previous intervals within the same point

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SITE 14 SOUTH PROGRESS REPORT

TABLE 2-2

GROUNDWATER QUALITY DATA DURING INJECTION

Well	Date	Time	Cond (µmhos/cm)	ORP (mV)	pH	TDS (ppm)	Temp (°C)	Iron (ppm)	H ₂ O ₂ (ppm)
ERM-1	1/18/2005	1027	1638	-4	6.62	1196	12.8	1.6	ND<0.2
ERM-3	1/19/2005	1335	1477	-8	6.52	1066	17.0	2.4	ND<0.2
	1/19/2005	1443	1787	33	6.58	1308	17.8	1.6	ND<0.2
	1/20/2005	0825	1647	-22	6.33	1207	14.0	1.2	ND<0.2
W14-1	1/18/2005	1257	353	132	8.05	238	16.2	1.2	ND<0.2
	1/18/2005	1530	344	58	8.74	230	16.8	1.2	ND<0.2
	1/19/2005	0840	344	228	7.23	234	12.8	0.8	0.2
	1/20/2005	0930	344	114	8.16	234	12.9	1.0	ND<0.2
W14-2	1/18/2005	1027	1185	-26	6.82	851	12.1	4.0	ND<0.2
	1/18/2005	1257	1144	-42	6.98	816	15.0	5.6	ND<0.2
	1/18/2005	1530	1205	-36	6.66	855	17.0	6.0	0.2
	1/19/2005	0840	1167	-18	6.87	838	11.0	4.6	0.2
	1/20/2005	0940	1183	-53	6.88	848	12.5	6.0	ND<0.2

Abbreviations and Acronyms:

µmhos/cm - micromhos per centimeter
°C - degrees Celsius
Cond - conductivity
H₂O₂ - hydrogen peroxide concentration
mV - millivolts
ND - not detected
pH - hydrogen (ion) concentration
ppm - parts per million
ORP - oxidation-reduction potential
TDS - total dissolved solids
Temp - temperature

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3.0 GROUNDWATER MONITORING

This section provides a summary of the objective, activities, and results of activities that are associated with groundwater monitoring that was conducted as part of the implementation of the *Final Site 14 South Corrective Action Plan and Associated Work Plan* (CAP) (Tetra Tech FW, Inc. [TtFW], 2004a) and *Addendum to the Site 14 South Corrective Action Plan and Associated Work Plan* (Addendum to the CAP) (TtFW, 2004b). This section also discusses the effectiveness and conclusions of in situ chemical oxidation (ISCO) using modified Fenton's Reagent.

3.1 OBJECTIVE OF ACTIVITIES

The objective of groundwater monitoring was to evaluate the effectiveness of ISCO by injection of modified Fenton's Reagent as a means of reducing petroleum contaminant concentrations.

3.2 ACTIVITIES

The activities associated with groundwater monitoring included the following:

- Conduct a baseline groundwater sampling event prior to ISCO injection
- Conducting four rounds of quarterly groundwater sampling post-ISCO injection

All field activities were completed in accordance with the CAP (TtFW, 2004a) and the Addendum to the CAP (TtFW, 2004b).

3.2.1 Potentiometric Surface at Site 14 South

Prior to each sampling event, water levels were measured to prepare potentiometric surface maps of the upper portion of the A aquifer at Site 14 South. Figure 3-1 shows the locations of the Site 14 South monitoring wells.

Measurements of depth-to-groundwater were made using an electronic measuring tape with markings every hundredth of a foot. All water levels were measured prior to sampling. Depth-to-groundwater measurements were subtracted from surveyed measuring point elevations to calculate the groundwater level elevations. Depth-to-groundwater measurements were collected from seven monitoring wells on January 10, 2005, April 20, 2005, and July 21, 2005, and from eight monitoring wells on October 17, 2005, and January 16, 2006.

3.2.2 Baseline Groundwater Sampling

In January 2005, a baseline groundwater sampling event was conducted. The baseline event established the values of groundwater contaminant concentrations prior to the injection of modified Fenton's Reagent.

The depth to groundwater in all monitoring wells was less than 15 feet bgs, allowing the use of a peristaltic pump for purging and sampling. Wells were purged by slowly lowering new high-density polyethylene (HDPE) tubing into the well to the midpoint of the screen interval, attaching the HDPE tubing to a peristaltic pump, and pumping at a low flow rate of approximately 0.2 to 0.5 liters per minute (L/min). During purging, pH, temperature, turbidity, specific electrical conductance, oxidation-reduction potential, and dissolved oxygen were monitored approximately every 3 to 5 minutes. Purging continued until indicator parameters stabilized. Flow rates were reduced to 0.1 and 0.2 L/min prior to filling volatile organic analysis vials.

Eight samples, including one duplicate sample, were collected from seven monitoring wells at Site 14 South for the baseline groundwater sampling event. Samples were analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX) compounds, methyl tert-butyl ether (MTBE), and total purgeable petroleum hydrocarbons (TPH-purgeable) as gasoline (TPH-gas).

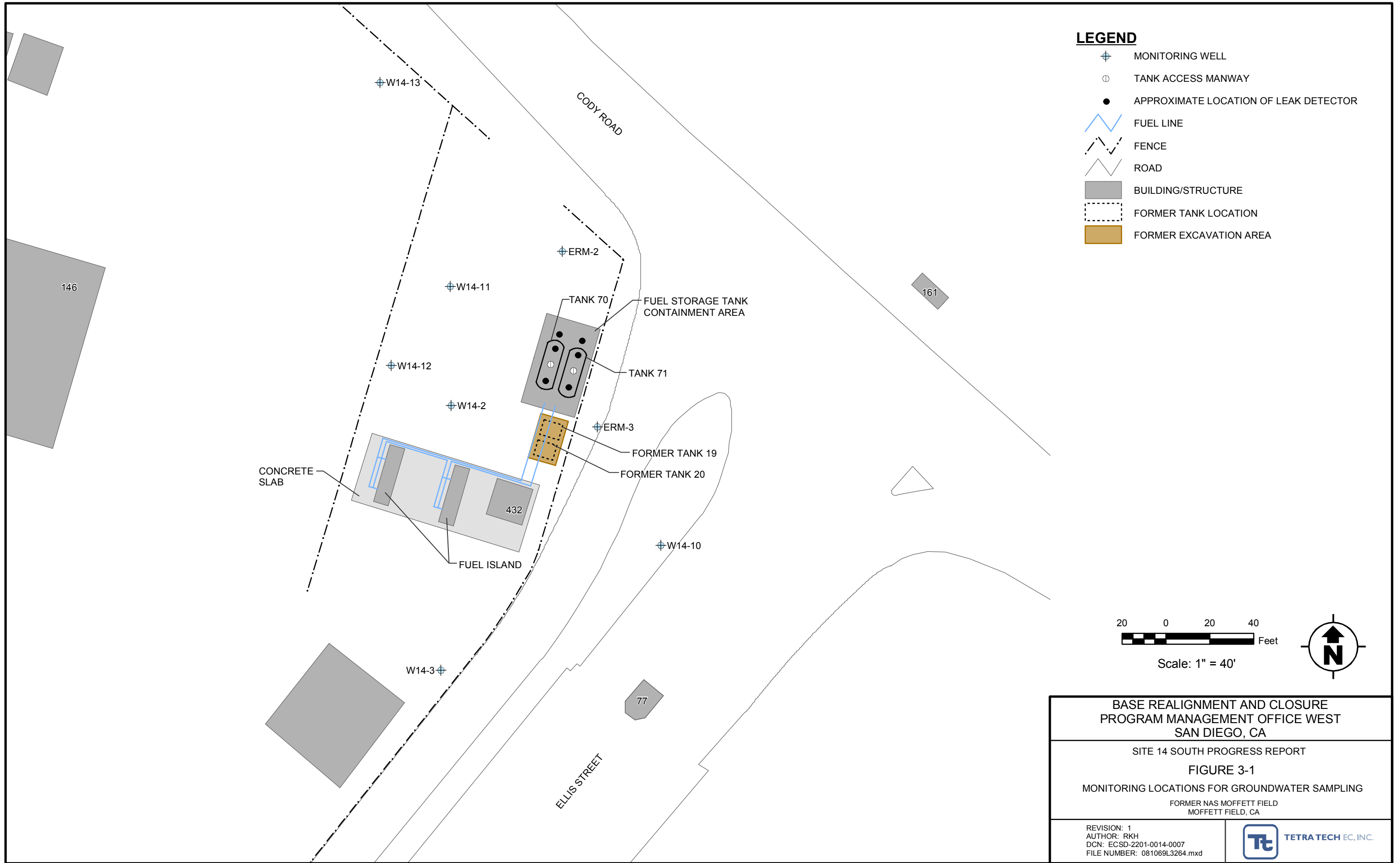
All purge water generated during groundwater sampling was treated at the West-Side Aquifers Treatment System (WATS) in accordance with the CAP (TtFW, 2004a).

3.2.3 Quarterly Post-injection Groundwater Sampling

Post-injection groundwater monitoring began approximately 3 months after the injection of the modified Fenton's Reagent. Rounds 1 through 4 were conducted in April 2005, July 2005, October 2005, and January 2006, respectively. Groundwater sampling followed the same procedures that were used during the baseline event.

Eight samples, including one duplicate sample, were collected from seven monitoring wells at Site 14 South during round 1 and round 2 post-injection groundwater sampling. Samples were analyzed for BTEX compounds, MTBE, and TPH-gas. Nine samples, including one duplicate sample, were collected from eight monitoring wells at Site 14 South during round 3 post-injection groundwater sampling. Monitoring well W14-13 was added in round 3 to provide complete coverage along the downgradient edge of the contaminant plume. Samples were analyzed for BTEX compounds, MTBE, and TPH-gas. In addition, major cations and anions were sampled during round 3 to determine the geochemistry of groundwater in Site 14 South monitoring wells and to determine whether there is any geochemical difference between the monitoring wells. Nine samples, including one duplicate sample, were collected from eight monitoring wells at Site 14 South during round 4 post-injection groundwater sampling. Samples were analyzed for BTEX compounds, MTBE, and TPH-gas.

All purge water generated during groundwater sampling was treated at WATS in accordance with the CAP (TtFW, 2004a)



3.3 RESULTS OF ACTIVITIES

Appendix A contains photographs of field activities.

Table 3-1 provides the results of water level gauging at Site 14 South.

The potentiometric surfaces of the upper portion of the A aquifer are shown on Figures 3-2 through 3-6. In general, the groundwater elevations are similar to previous measurements, with some minor fluctuations. Generally, the groundwater flows from the southeast to the northwest at Site 14 South. The gradient from upgradient well W14-3 to downgradient well ERM-2 was approximately:

- 0.006 feet per foot (ft/ft) in January 2005
- 0.005 ft/ft in April 2005
- 0.006 ft/ft in July 2005
- 0.005 ft/ft in October 2005
- 0.004 ft/ft in January 2006

3.3.1 Baseline Groundwater Sampling

Groundwater samples were collected from seven wells during baseline groundwater sampling on January 10 and 11, 2005. Table 3-2 provides the results of baseline groundwater sampling. Groundwater sampling data sheets are provided in Appendix D (provided on CD only). Appendix E contains the laboratory analytical data sheets (provided on CD only).

BTEX compounds and TPH-gas were not detected above the project reporting limits in samples collected from wells ERM-2, W14-3, W14-10 and W14-12. BTEX compounds were not detected above the project reporting limits in the sample collected from well W14-11. MTBE was not detected above the project reporting limit in any samples collected during the baseline sampling event.

Ethylbenzene, toluene, and xylene were detected at concentrations below their respective environmental screening levels (ESLs) in samples collected from well ERM-3. Ethylbenzene and toluene were detected at concentrations below their respective ESL in samples collected from well W14-2 (see Table 3-2).

The following details the detected concentrations above their respective ESLs during baseline sampling:

- Benzene was detected at concentrations of 130 micrograms per liter ($\mu\text{g/L}$) and 9,800 $\mu\text{g/L}$ in samples collected from wells ERM-3 and W14-2, respectively.

- Xylene was detected at a concentration of 120 µg/L in a sample collected from well W14-2.
- TPH-gas was detected at concentrations of 220 µg/L, 3,200 µg/L, and 480 µg/L in samples collected from wells ERM-3, W14-2, and W14-11, respectively.

Figure 3-7 shows the interpreted area of benzene, xylene, and TPH-gas concentrations in groundwater exceeding their respective ESL prior to injecting the modified Fenton's Reagent.

3.3.2 Round 1 Post-injection Groundwater Sampling

Groundwater samples were collected from seven wells during round 1 sampling on April 20 and 21, 2005. Table 3-2 provides the results of round 1 groundwater sampling. Groundwater sampling data sheets are provided in Appendix D (provided on CD only). Appendix E contains the laboratory analytical data sheets (provided on CD only).

BTEX compounds and TPH-gas were not detected above the project reporting limits in samples collected from wells ERM-2, W14-3, W14-10, and W14-12. Ethylbenzene was not detected above the project reporting limit in the sample collected from ERM-3. BTEX compounds were not detected above the project reporting limit in the sample collected from W14-11. MTBE was not detected above the project reporting limit in any samples collected during the round 1 sampling event.

Toluene, xylene, and TPH-gas were detected at concentrations below their respective ESL in samples collected from well ERM-3. Ethylbenzene and toluene were detected at concentrations below their respective ESLs in samples collected from well W14-2.

The following details the detected concentrations above their respective ESLs during round 1 sampling:

- Benzene was detected at a concentration of 46 µg/L in a sample collected from well ERM-3 and 2,100 µg/L in a sample collected from well W14-2.
- Xylene was detected at a concentration of 25 µg/L in a sample collected from well W14-2.
- TPH-gas was detected at a concentration of 330 µg/L in a sample collected from well W14-11 and 1,100 µg/L in a sample collected from well W14-2.

Figure 3-8 shows the interpreted area of benzene, xylene, and TPH-gas concentrations in groundwater exceeding their respective ESL during the round 1 post-injection sampling event. Detected concentrations in samples collected during round 1 above their respective ESL were compared to baseline conditions. Concentrations of benzene and xylene in samples collected during round 1 decreased by approximately 80 percent. Concentrations of TPH-gas in samples

SITE 14 SOUTH PROGRESS REPORT

TABLE 3-1

GROUNDWATER ELEVATIONS

Location	ToC Elevation (ft msl)	January 10, 2005 Depth to Water ¹ (ft)	January 10, 2005 Water Elevation (ft msl)	April 20, 2005 Depth to Water ¹ (ft)	April 20, 2005 Water Elevation (ft msl)	July 21, 2005 Depth to Water ¹ (ft)	July 21, 2005 Water Elevation (ft msl)
ERM-2	28.46	4.16	24.30	5.07	23.39	6.09	22.37
ERM-3	29.34	4.50	24.84	5.47	23.87	6.48	22.86
W14-2	28.52	3.90	24.62	4.97	23.55	6.00	22.52
W14-3	30.15	4.64	25.51	5.74	24.41	6.67	23.48
W14-10	29.58	4.15	25.43	5.13	24.45	6.42	23.16
W14-11	29.07	4.50	24.57	5.74	23.33	6.75	22.32
W14-12	29.71	4.52	25.19	5.68	24.03	6.67	23.04
W14-13	28.80	NM	NM	NM	NM	NM	NM

Location	ToC Elevation (ft msl)	October 17, 2005 Depth to Water ¹ (ft)	October 17, 2005 Water Elevation (ft msl)	January 16, 2006 Depth to Water ¹ (ft)	January 16, 2006 Water Elevation (ft msl)
ERM-2	28.46	6.37	22.09	3.10	25.36
ERM-3	29.34	6.70	22.64	3.55	25.79
W14-2	28.52	6.32	22.20	3.05	25.47
W14-3	30.15	7.02	23.13	4.02	26.13
W14-10	29.58	6.68	22.90	3.47	26.11
W14-11	29.07	7.07	22.00	3.77	25.30
W14-12	29.71	7.00	22.71	3.78	25.93
W14-13	28.80	7.16	21.64	4.09	24.71

Note:

¹ Depth-to-water may vary from field sampling data forms (Appendix D). Data were collected on separate dates.

Abbreviations and Acronyms:

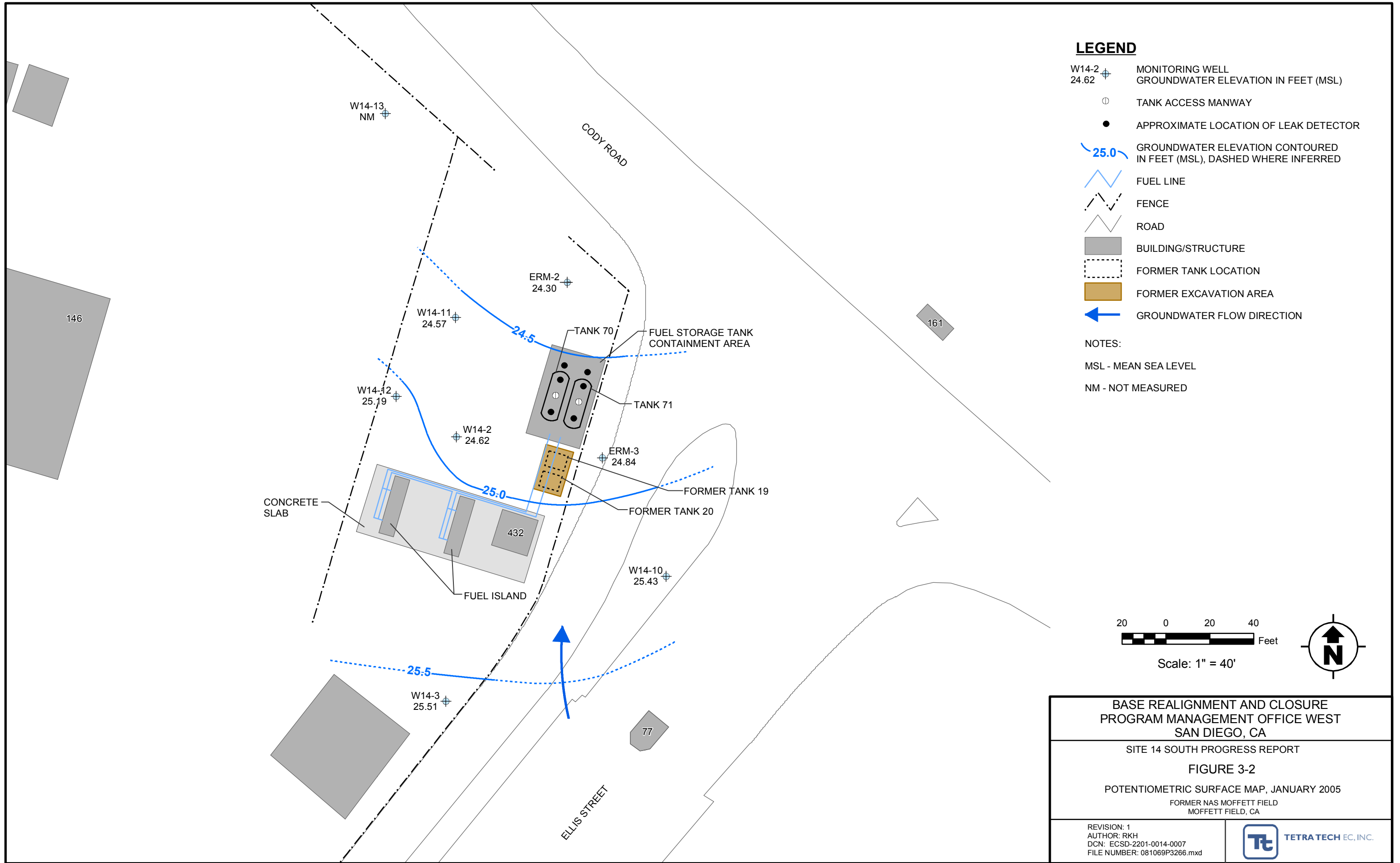
ft – feet

msl – mean sea level

NM – not measured

ToC – top of casing

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BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

SITE 14 SOUTH PROGRESS REPORT

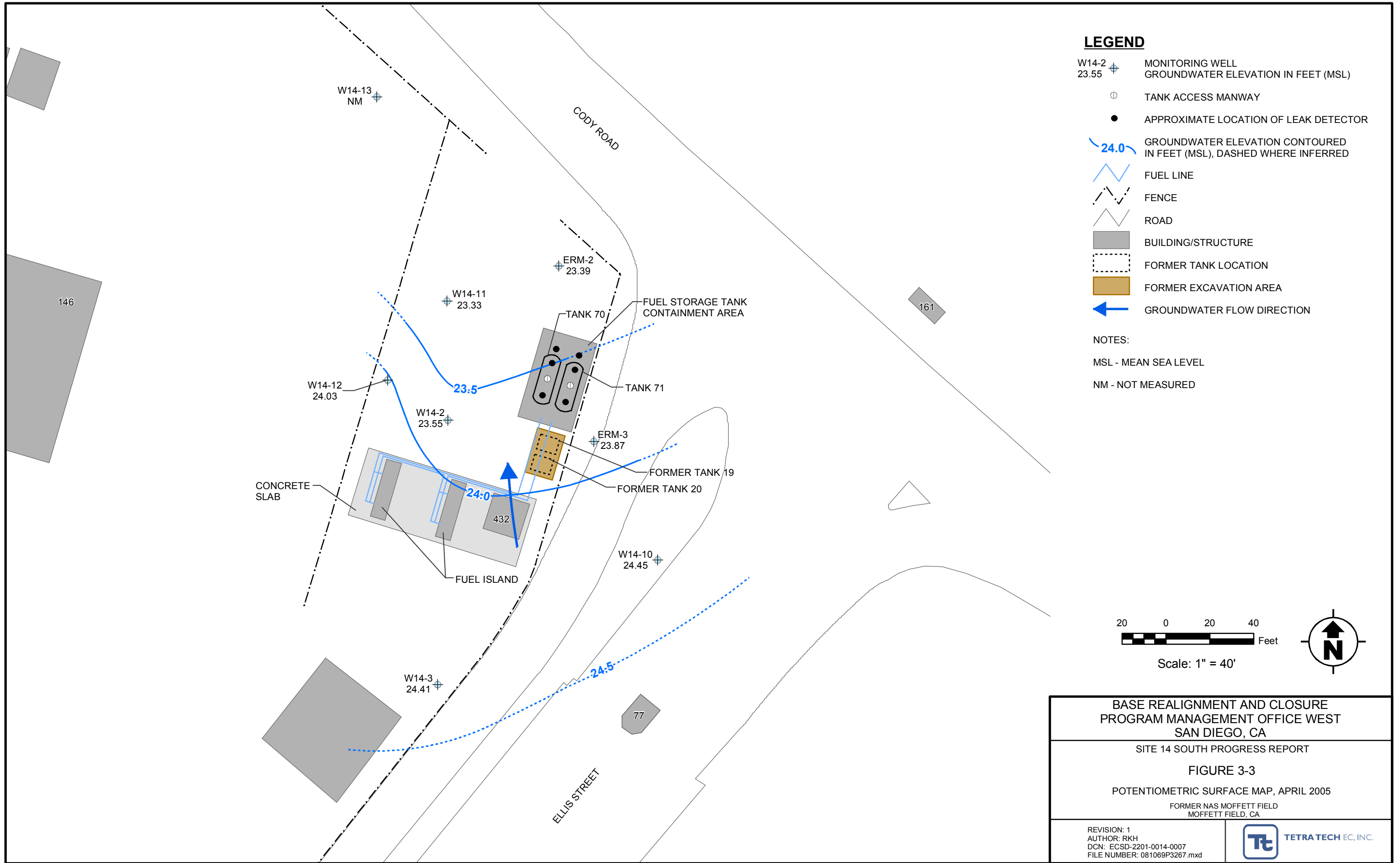
FIGURE 3-2

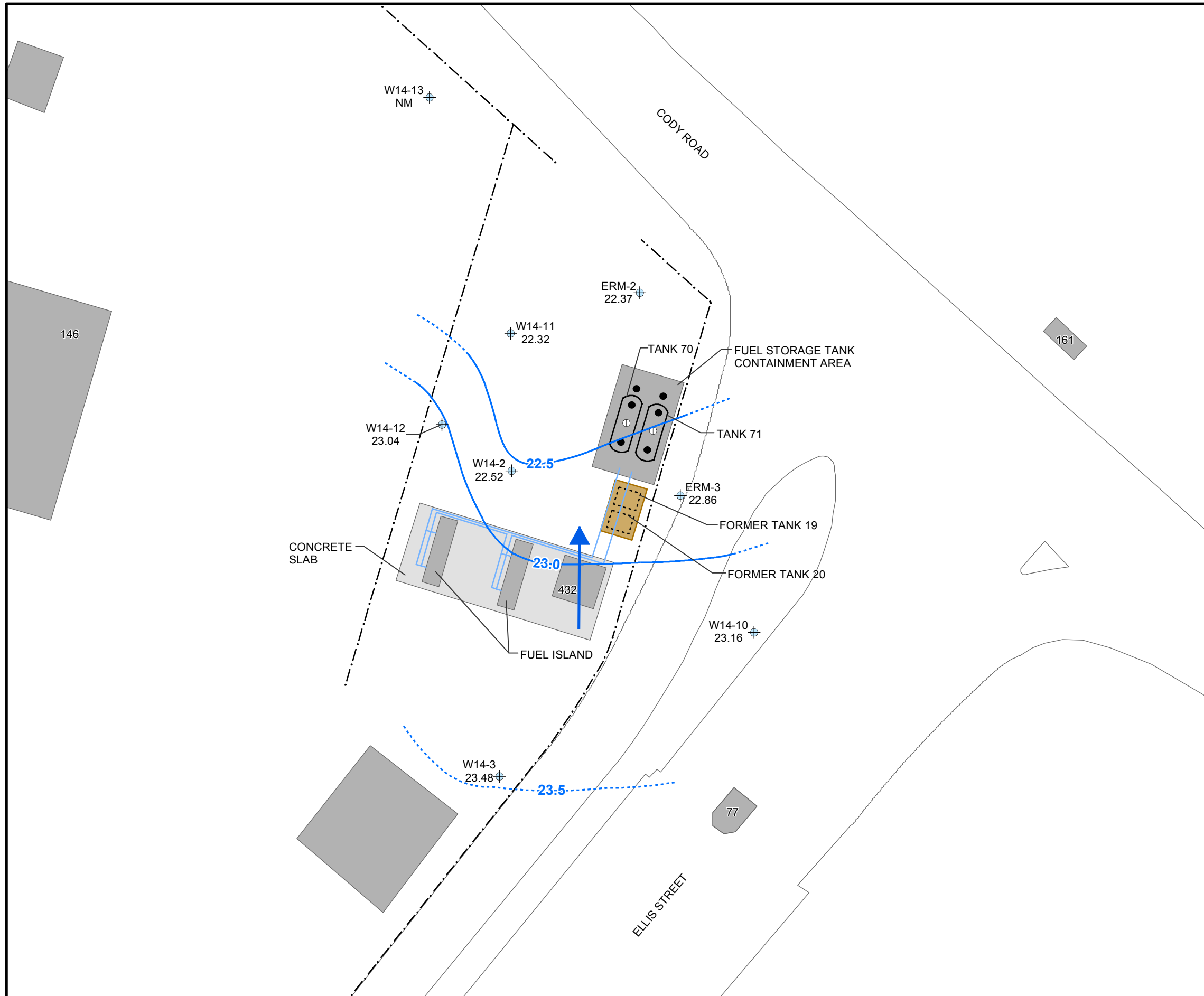
POTENTIOMETRIC SURFACE MAP, JANUARY 2005

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CA

REVISION: 1
AUTHOR: RKH
DCN: ECSD-2201-0014-0007
FILE NUMBER: 081069P3266.mxd







LEGEND

W14-2 22.52 MONITORING WELL
GROUNDWATER ELEVATION IN FEET (MSL)

TANK ACCESS MANWAY

APPROXIMATE LOCATION OF LEAK DETECTOR

23.0 GROUNDWATER ELEVATION CONTOURED IN FEET (MSL), DASHED WHERE INFERRED

FUEL LINE

FENCE

ROAD

BUILDING/STRUCTURE

FORMER TANK LOCATION

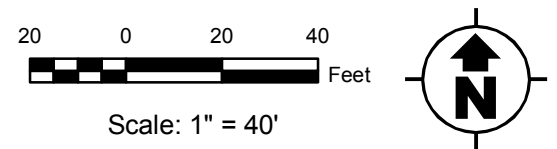
FORMER EXCAVATION AREA

GROUNDWATER FLOW DIRECTION

NOTES:

MSL - MEAN SEA LEVEL

NM - NOT MEASURED



BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST SAN DIEGO, CA	
SITE 14 SOUTH PROGRESS REPORT FIGURE 3-4 POTENTIOMETRIC SURFACE MAP, JULY 2005 FORMER NAS MOFFETT FIELD MOFFETT FIELD, CA	
REVISION: 1 AUTHOR: RKH DCN: ECSD-2201-0014-0007 FILE NUMBER: 081069P3268.mxd	TETRA TECH EC, INC.



LEGEND

W14-2 22.20 MONITORING WELL
GROUNDWATER ELEVATION IN FEET (MSL)

TANK ACCESS MANWAY

APPROXIMATE LOCATION OF LEAK DETECTOR

23.0 GROUNDWATER ELEVATION CONTOURED IN FEET (MSL), DASHED WHERE INFERRED

FUEL LINE

FENCE

ROAD

BUILDING/STRUCTURE

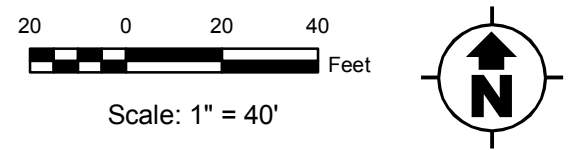
FORMER TANK LOCATION

FORMER EXCAVATION AREA

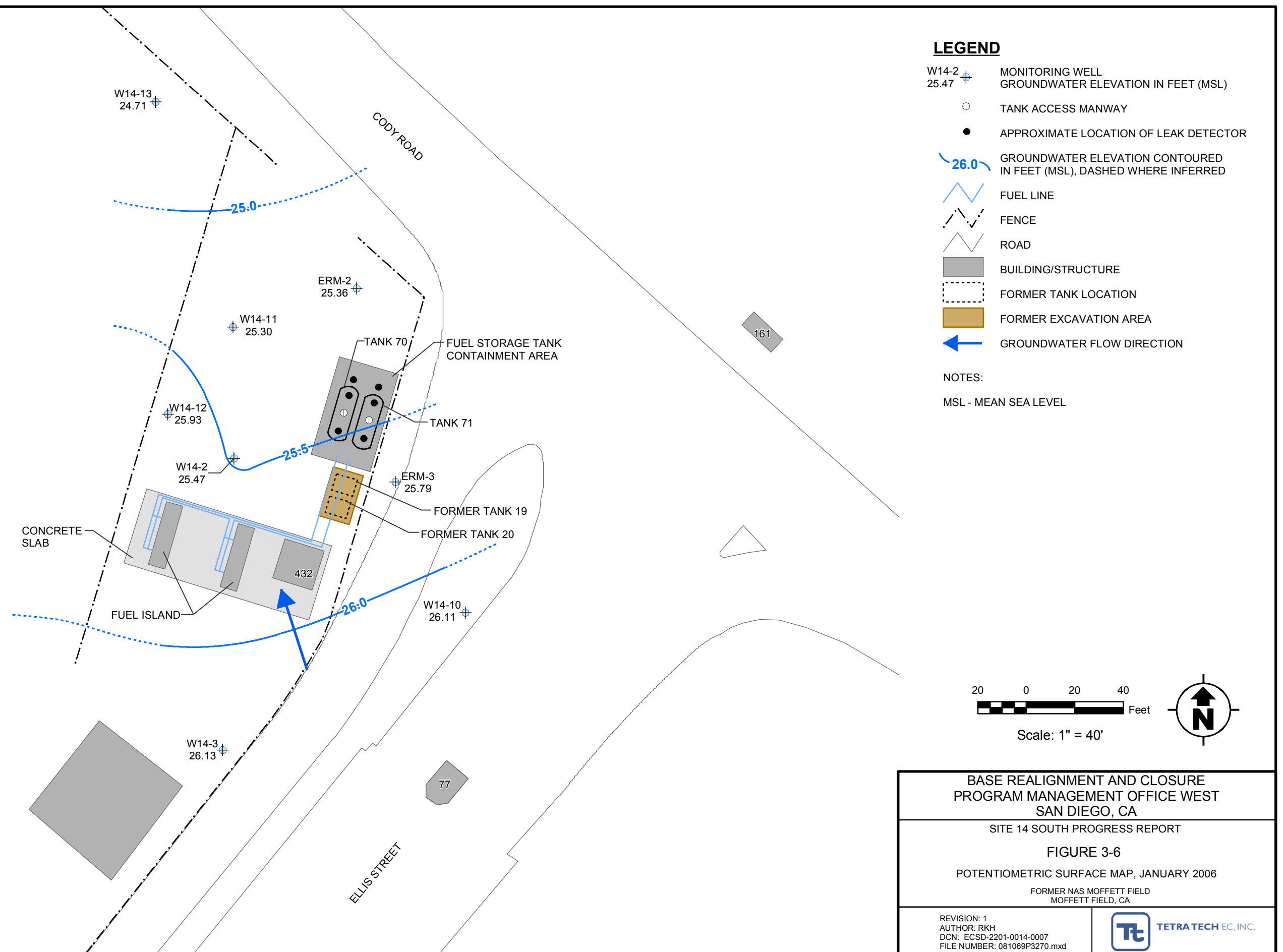
GROUNDWATER FLOW DIRECTION

NOTES:

MSL - MEAN SEA LEVEL



BASE REALIGNMENT AND CLOSURE PROGRAM MANAGEMENT OFFICE WEST SAN DIEGO, CA	
SITE 14 SOUTH PROGRESS REPORT	
FIGURE 3-5	
POTENTIOMETRIC SURFACE MAP, OCTOBER 2005	
FORMER NAS MOFFETT FIELD MOFFETT FIELD, CA	
REVISION: 1 AUTHOR: RKH DCN: ECSD-2201-0014-0007 FILE NUMBER: 081069P3269.mxd	TETRA TECH EC, INC.



SITE 14 SOUTH PROGRESS REPORT

Page 1 of 4

TABLE 3-2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS POTENTIAL FUTURE USE SCENARIO

Baseline Sampling Event

Sample Number:				86-S14-035	86-S14-036	86-S14-037	86-S14-040	86-S14-041	86-S14-042	86-S14-038	86-S14-039
Location:				ERM-2	ERM-2 (DUP)	ERM-3	W14-10	W14-11	W14-12	W14-2	W14-3
Sample Date:				01/10/2005	01/10/2005	01/10/2005	01/11/2005	01/11/2005	01/11/2005	01/10/2005	01/10/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	1.0	1 U	1 U	130	1 U	1 U	1 U	9800	1 U
ETHYLBENZENE	µg/L	EPA 8260B	30	1 U	1 U	0.46 J	1 U	1 U	1 U	24	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	5.0	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	40	1 U	1 U	4.7	1 U	1 U	1 U	35	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	20	3 U	3 U	10	3 U	3 U	3 U	120	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	100	100 U	100 U	220	100 U	480	100 U	3200	100 U

Round 1 Sampling Event

Sample Number:				86-S14-045	86-S14-046	86-S14-047	86-S14-050	86-S14-051	86-S14-052	86-S14-048	86-S14-049
Location:				ERM-2	ERM-3	ERM-3 (DUP)	W14-10	W14-11	W14-12	W14-2	W14-3
Sample Date:				04/21/2005	04/21/2005	04/21/2005	04/21/2005	04/21/2005	04/20/2005	04/20/2005	04/20/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	1.0	1 U	46	38	1 U	1 U	1 U	2100	1 U
ETHYLBENZENE	µg/L	EPA 8260B	30	1 U	1 U	1 U	1 U	1 U	1 U	1.9 J	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	5.0	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U
TOLUENE	µg/L	EPA 8260B	40	1 U	1.5	1.3	1 U	1 U	1 U	3.5 J	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	20	3 U	1.5 J	1.4 J	3 U	3 U	3 U	25	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	100	100 U	38 J	36 J	100 U	330	100 U	1100	100 U

Round 2 Sampling Event

Sample Number:				86-S14-055	86-S14-056	86-S14-060	86-S14-061	86-S14-062	86-S14-057	86-S14-058	86-S14-059
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-12	W14-2	W14-2 (DUP)	W14-3
Sample Date:				07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	1.0	1 U	88	1 U	1 U	1 U	3000	3000	1 U
ETHYLBENZENE	µg/L	EPA 8260B	30	1 U	1	1 U	1 U	1 U	2.7	2.8	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	5.0	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	40	1 U	7.4	1 U	1 U	1 U	10	11	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	20	3 U	15	3 U	3 U	3 U	41	41	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	100	100 U	290	100 U	760	23 J	1900	2000	100 U

SITE 14 SOUTH PROGRESS REPORT

Page 2 of 4

TABLE 3-2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS POTENTIAL FUTURE USE SCENARIO

Round 3 Sampling Event

Sample Number:				86-S14-065	86-S14-066	86-S14-070	86-S14-071	86-S14-072	86-S14-073	86-S14-067	86-S14-068	86-S14-069
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-12	W14-13	W14-2	W14-3	W14-3 (DUP)
Sample Date:				10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/17/2005	10/17/2005
Analyte	Units	Method	ESL									
BENZENE	µg/L	EPA 8260B	1.0	1 U	62	1 U	1 U	1 U	1 U	8900	1 U	1 U
ETHYLBENZENE	µg/L	EPA 8260B	30	1 U	0.52 J	1 U	1 U	1 U	1 U	43	1 U	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	5.0	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	40	1 U	5.4	1 U	1 U	1 U	1 U	43	1 U	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	20	3 U	12	3 U	0.71 J	3 U	3 U	130	3 U	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	100	100 U	240	100 U	550	21 J	100 U	3900	100 U	100 U
CALCIUM	mg/L	EPA 6010B	N/A	221 J	202 J	261 J	218 J	236 J	222 J	198 J	157 J	153 J
IRON	mg/L	EPA 6010B	N/A	1.3	1.94	0.1 U	0.1 U	0.657	2.57	3.93	1.07	0.977
MAGNESIUM	mg/L	EPA 6010B	N/A	67.1	72.7	105	88.7	87	89.7	56.2	47.4	43.8
POTASSIUM	mg/L	EPA 6010B	N/A	1.99 U	2.3 U	3.38 U	2.65 U	2.08 U	1.89 U	1.48 U	5 U	3.54 U
SODIUM	mg/L	EPA 6010B	N/A	36.3	32.1	28.4	35.9	30.9	34.2	47.5	35.3	33.4
ALKALINITY AS CaCO ₃	mg/L	EPA 310.1	N/A	539	504	409	557	404	447	728	304	289
BICARBONATE ALKALINITY	mg/L	EPA 310.1	N/A	539	504	409	557	404	447	728	304	289
CARBONATE	mg/L	EPA 310.1	N/A	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLORIDE	mg/L	EPA 300.0	N/A	35.2	33.8	34.8	31.1	37.1	31.3	19.3	45.9	46.3
NITRATE	mg/L	EPA 300.0	N/A	0.671	0.1 U	0.1 U	0.1 U	0.295	0.378	0.23	0.1 U	0.1 U
NITRITE	mg/L	EPA 300.0	N/A	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PHOSPHATE	mg/L	EPA 300.0	N/A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SULFATE	mg/L	EPA 300.0	N/A	289	309	658	342	555	443	0.485 J	234	236

Round 4 Sampling Event

Sample Number:				86-S14-074	86-S14-075	86-S14-078	86-S14-079	86-S14-080	86-S14-081	86-S14-082	86-S14-076	86-S14-077
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-11 (DUP)	W14-12	W14-13	W14-2	W14-3
Sample Date:				01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/17/2006	01/16/2006	01/17/2006
Analyte	Units	Method	ESL									
BENZENE	µg/L	EPA 8260B	1.0	1 U	1 U	1 U	31	31	1 U	1 U	8200	1 U
ETHYLBENZENE	µg/L	EPA 8260B	30	1 U	1 U	1 U	1 U	1 U	1 U	1 U	15	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	5.0	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U
TOLUENE	µg/L	EPA 8260B	40	1 U	1 U	1 U	1 U	1 U	1 U	1 U	39	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	20	3 U	3 U	3 U	3 U	3 U	3 U	3 U	120	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	100	100 U	100 U	100 U	210	270	100 U	100 U	2900	100 U

Notes:

Shading indicates concentrations above the ESL (CA Regional Water Quality Control Board, May 2008; Table F1-a Groundwater Screening Levels [Groundwater is a current or potential source of drinking water])

Abbreviations and Acronyms:

µg/L - micrograms per liter
 CaCO₃ - calcium carbonate
 mg/L - milligrams per liter
 DUP - duplicate sample
 EPA - U.S. Environmental Protection Agency
 ESL - environmental screening level
 J - estimated value
 TPH-purgeable - total purgeable petroleum hydrocarbons
 U - analyte not detected above project reporting limit

SITE 14 SOUTH PROGRESS REPORT

Page 3 of 4

TABLE 3-2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS CURRENT USE SCENARIO

Baseline Sampling Event

Sample Number:				86-S14-035	86-S14-036	86-S14-037	86-S14-040	86-S14-041	86-S14-042	86-S14-038	86-S14-039
Location:				ERM-2	ERM-2 (DUP)	ERM-3	W14-10	W14-11	W14-12	W14-2	W14-3
Sample Date:				01/10/2005	01/10/2005	01/10/2005	01/11/2005	01/11/2005	01/11/2005	01/10/2005	01/10/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	540	1 U	1 U	130	1 U	1 U	1 U	9800	1 U
ETHYLBENZENE	µg/L	EPA 8260B	300	1 U	1 U	0.46 J	1 U	1 U	1 U	24	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	1800	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	400	1 U	1 U	4.7	1 U	1 U	1 U	35	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	5300	3 U	3 U	10	3 U	3 U	3 U	120	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	5000	100 U	100 U	220	100 U	480	100 U	3200	100 U

Round 1 Sampling Event

Sample Number:				86-S14-045	86-S14-046	86-S14-047	86-S14-050	86-S14-051	86-S14-052	86-S14-048	86-S14-049
Location:				ERM-2	ERM-3	ERM-3 (DUP)	W14-10	W14-11	W14-12	W14-2	W14-3
Sample Date:				04/21/2005	04/21/2005	04/21/2005	04/21/2005	04/21/2005	04/20/2005	04/20/2005	04/20/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	540	1 U	46	38	1 U	1 U	1 U	2100	1 U
ETHYLBENZENE	µg/L	EPA 8260B	300	1 U	1 U	1 U	1 U	1 U	1 U	1.9 J	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	1800	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U
TOLUENE	µg/L	EPA 8260B	400	1 U	1.5	1.3	1 U	1 U	1 U	3.5 J	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	5300	3 U	1.5 J	1.4 J	3 U	3 U	3 U	25	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	5000	100 U	38 J	36 J	100 U	330	100 U	1100	100 U

Round 2 Sampling Event

Sample Number:				86-S14-055	86-S14-056	86-S14-060	86-S14-061	86-S14-062	86-S14-057	86-S14-058	86-S14-059
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-12	W14-2	W14-2 (DUP)	W14-3
Sample Date:				07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005	07/21/2005
Analyte	Units	Method	ESL								
BENZENE	µg/L	EPA 8260B	540	1 U	88	1 U	1 U	1 U	3000	3000	1 U
ETHYLBENZENE	µg/L	EPA 8260B	300	1 U	1	1 U	1 U	1 U	2.7	2.8	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	1800	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	400	1 U	7.4	1 U	1 U	1 U	10	11	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	5300	3 U	15	3 U	3 U	3 U	41	41	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	5000	100 U	290	100 U	760	23 J	1900	2000	100 U

TABLE 3-2

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CURRENT USE SCENARIO**

Round 3 Sampling Event

Sample Number:				86-S14-065	86-S14-066	86-S14-070	86-S14-071	86-S14-072	86-S14-073	86-S14-067	86-S14-068	86-S14-069
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-12	W14-13	W14-2	W14-3	W14-3 (DUP)
Sample Date:				10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/18/2005	10/17/2005	10/17/2005
Analyte	Units	Method	ESL									
BENZENE	µg/L	EPA 8260B	540	1 U	62	1 U	1 U	1 U	1 U	8900	1 U	1 U
ETHYLBENZENE	µg/L	EPA 8260B	300	1 U	0.52 J	1 U	1 U	1 U	1 U	43	1 U	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	1800	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
TOLUENE	µg/L	EPA 8260B	400	1 U	5.4	1 U	1 U	1 U	1 U	43	1 U	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	5300	3 U	12	3 U	0.71 J	3 U	3 U	130	3 U	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	5000	100 U	240	100 U	550	21 J	100 U	3900	100 U	100 U
CALCIUM	mg/L	EPA 6010B	N/A	221 J	202 J	261 J	218 J	236 J	222 J	198 J	157 J	153 J
IRON	mg/L	EPA 6010B	N/A	1.3	1.94	0.1 U	0.1 U	0.657	2.57	3.93	1.07	0.977
MAGNESIUM	mg/L	EPA 6010B	N/A	67.1	72.7	105	88.7	87	89.7	56.2	47.4	43.8
POTASSIUM	mg/L	EPA 6010B	N/A	1.99 U	2.3 U	3.38 U	2.65 U	2.08 U	1.89 U	1.48 U	5 U	3.54 U
SODIUM	mg/L	EPA 6010B	N/A	36.3	32.1	28.4	35.9	30.9	34.2	47.5	35.3	33.4
ALKALINITY AS CaCO ₃	mg/L	EPA 310.1	N/A	539	504	409	557	404	447	728	304	289
BICARBONATE ALKALINITY	mg/L	EPA 310.1	N/A	539	504	409	557	404	447	728	304	289
CARBONATE	mg/L	EPA 310.1	N/A	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLORIDE	mg/L	EPA 300.0	N/A	35.2	33.8	34.8	31.1	37.1	31.3	19.3	45.9	46.3
NITRATE	mg/L	EPA 300.0	N/A	0.671	0.1 U	0.1 U	0.1 U	0.295	0.378	0.23	0.1 U	0.1 U
NITRITE	mg/L	EPA 300.0	N/A	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PHOSPHATE	mg/L	EPA 300.0	N/A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SULFATE	mg/L	EPA 300.0	N/A	289	309	658	342	555	443	0.485 J	234	236

Round 4 Sampling Event

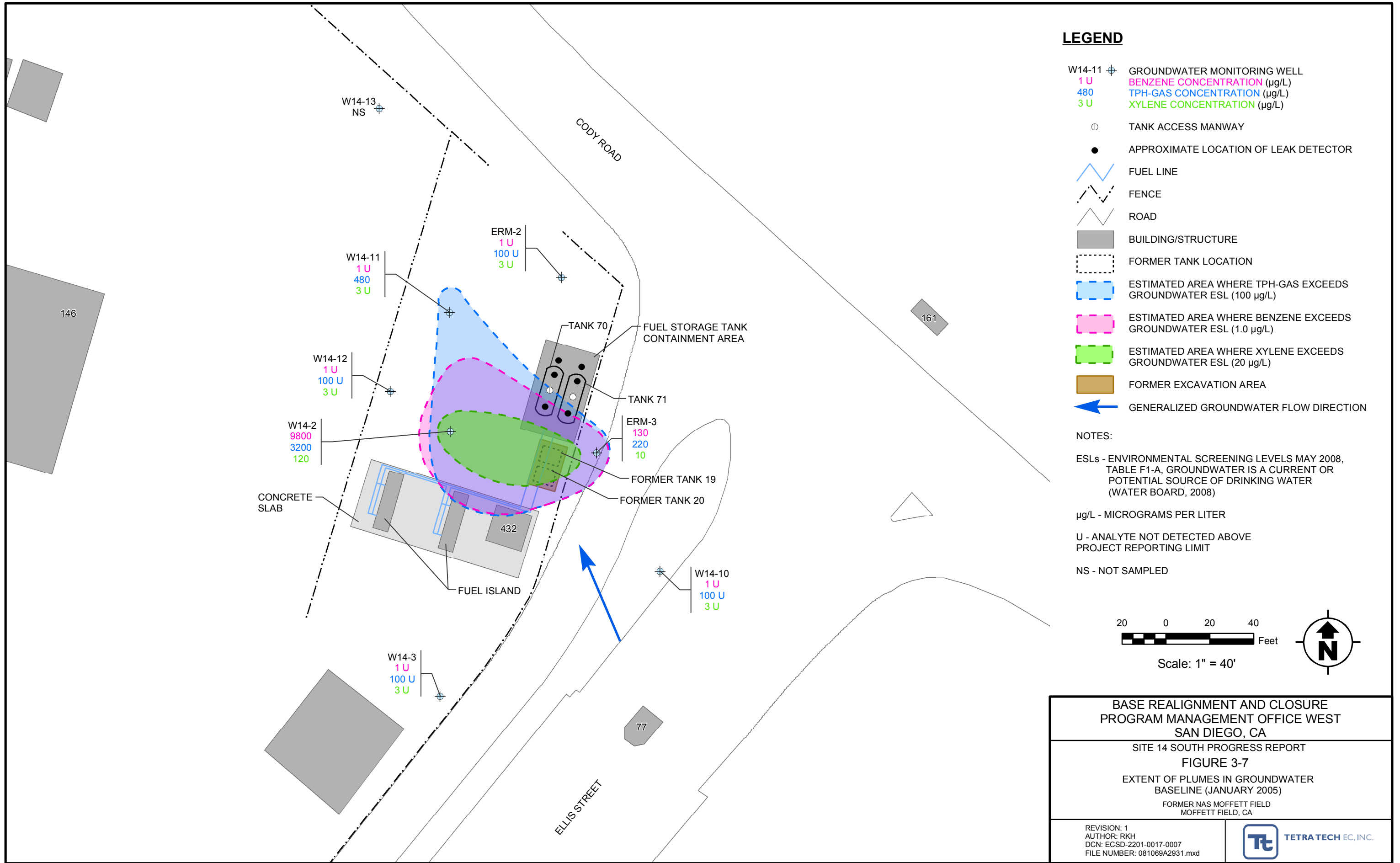
Sample Number:				86-S14-074	86-S14-075	86-S14-078	86-S14-079	86-S14-080	86-S14-081	86-S14-082	86-S14-076	86-S14-077
Location:				ERM-2	ERM-3	W14-10	W14-11	W14-11 (DUP)	W14-12	W14-13	W14-2	W14-3
Sample Date:				01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/16/2006	01/17/2006	01/16/2006	01/17/2006
Analyte	Units	Method	ESL									
BENZENE	µg/L	EPA 8260B	540	1 U	1 U	1 U	31	31	1 U	1 U	8200	1 U
ETHYLBENZENE	µg/L	EPA 8260B	300	1 U	1 U	1 U	1 U	1 U	1 U	1 U	15	1 U
METHYL TERT-BUTYL ETHER	µg/L	EPA 8260B	1800	1 U	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U
TOLUENE	µg/L	EPA 8260B	400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	39	1 U
XYLENE (TOTAL)	µg/L	EPA 8260B	5300	3 U	3 U	3 U	3 U	3 U	3 U	3 U	120	3 U
TPH-PURGEABLE (GASOLINE)	µg/L	EPA 8015B	5000	100 U	100 U	100 U	210	270	100 U	100 U	2900	100 U

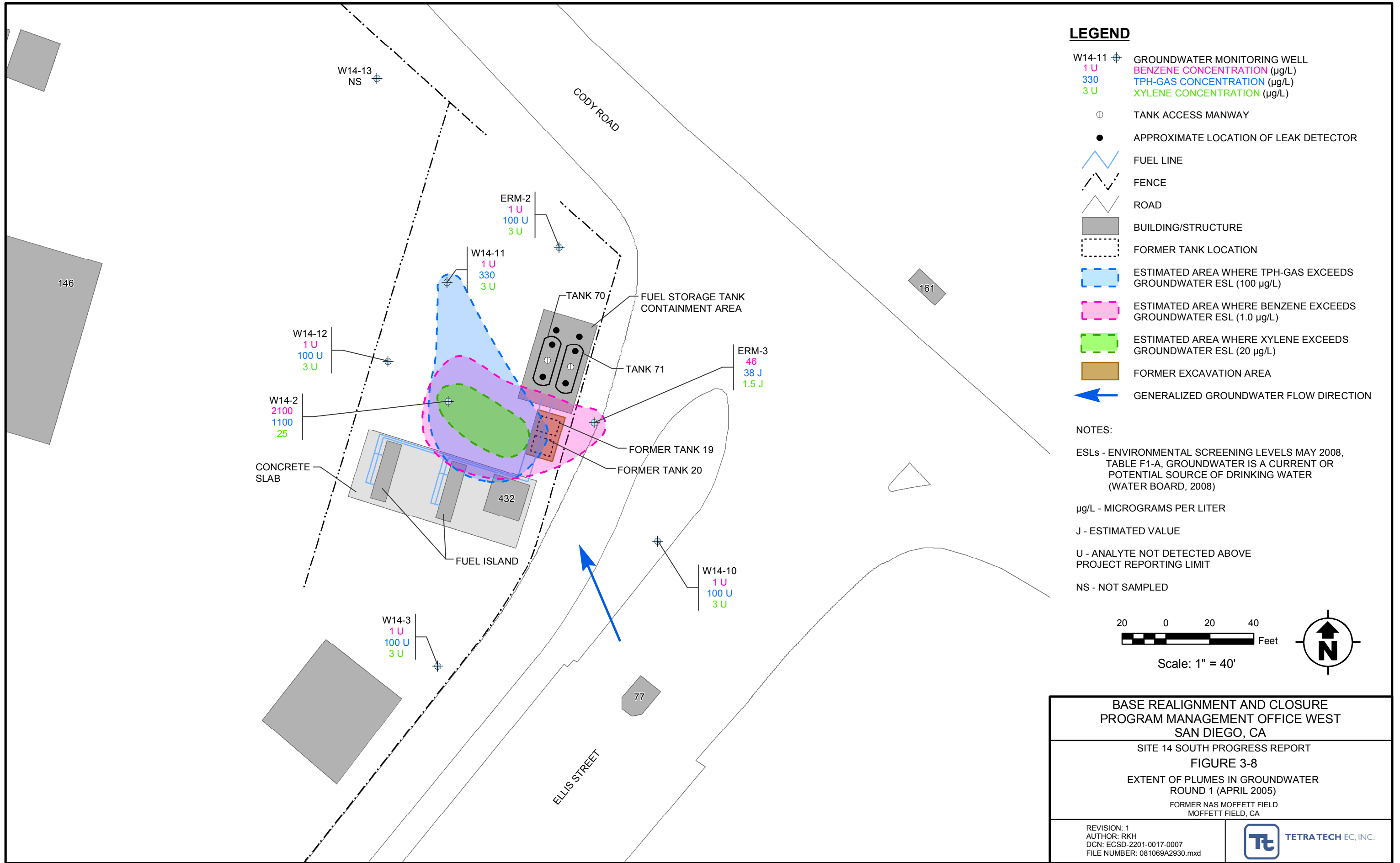
Notes:

Shading indicates concentrations above the ESL (CA Regional Water Quality Control Board, May 2008; Table F1-b Groundwater Screening Levels [Groundwater is not a current or potential source of drinking water])

Abbreviations and Acronyms:

µg/L - micrograms per liter	ESL - environmental screening level
CaCO ₃ - calcium carbonate	J - estimated value
mg/L - milligrams per liter	TPH-purgeable - total purgeable petroleum hydrocarbons
DUP - duplicate sample	U - analyte not detected above project reporting limit
EPA - U.S. Environmental Protection Agency	





collected during round 1 decreased by over 65 percent. ISCO had an immediate effect on the size and concentration of the groundwater contaminant plume.

3.3.3 Round 2 Post-injection Groundwater Sampling

Groundwater samples were collected from seven wells during round 2 sampling on July 21, 2005. Table 3-2 provided the results of round 2 groundwater sampling. Groundwater sampling data sheets are provided in Appendix D (provided on CD only). Appendix E contains the laboratory analytical data sheets (provided on CD only).

BTEX compounds and TPH-gas were not detected above the project reporting limits in samples collected from wells ERM-2, W14-3, and W14-10. BTEX compounds were not detected above the project reporting limits in the sample collected from well W14-12. MTBE was not detected above the project reporting limit in any samples collected during the round 2 sampling event.

Ethylbenzene, toluene, and xylene were detected at concentrations below their respective ESL in samples collected from well ERM-3. TPH-gas was detected at a concentration below its ESL in a sample collected from well W14-12. Ethylbenzene and toluene were detected at concentrations below their respective ESL in samples collected from well W14-2.

The following details the detected concentrations above their respective ESL during round 2 sampling:

- Benzene was detected at concentrations of 88 µg/L and 3,000 µg/L in samples collected from wells ERM-3 and W14-2, respectively.
- Xylene was detected at a concentration of 41 µg/L in the sample collected from well W14-2.
- TPH-gas was detected at concentrations of 290 µg/L, 760 µg/L, and 2,000 µg/L in samples collected from wells ERM-3, W14-11, and W14-2, respectively.

Figure 3-9 shows the interpreted area of benzene, xylene, and TPH-gas concentrations in groundwater exceeding their respective ESL during the round 2 post-injection sampling event. The estimated area where TPH-gas exceeds its ESL in groundwater migrated beyond downgradient well W14-11. The migration of downgradient contamination is considered to be caused by the injection of 14,590 gallons of modified Fenton's Reagent upgradient of this area. The injected fluid caused short-term localized groundwater mounding and enhanced the migration of contamination along the flow path. Therefore, well W14-13 was added to the groundwater monitoring program for round 3 in order to provide a new downgradient boundary. In addition, an estimated concentration of TPH-gas was detected in a sample collected from well W14-12. The detection was an estimated value well below the ESL for THP-gas; therefore, monitoring an additional well cross-gradient to W14-12 was not necessary. Concentrations of benzene, xylene, and TPH-gas increased slightly in samples collected during round 2; however,

concentrations are still reduced by approximately 50 percent or greater when compared to baseline conditions.

3.3.4 Round 3 Post-injection Groundwater Sampling

Groundwater samples were collected from eight wells during round 3 sampling on October 17 and 18, 2005. Table 3-2 provided the results of round 3 groundwater sampling. Groundwater sampling data sheets are provided in Appendix D (provided on CD only). Appendix E contains the laboratory analytical data sheets (provided on CD only).

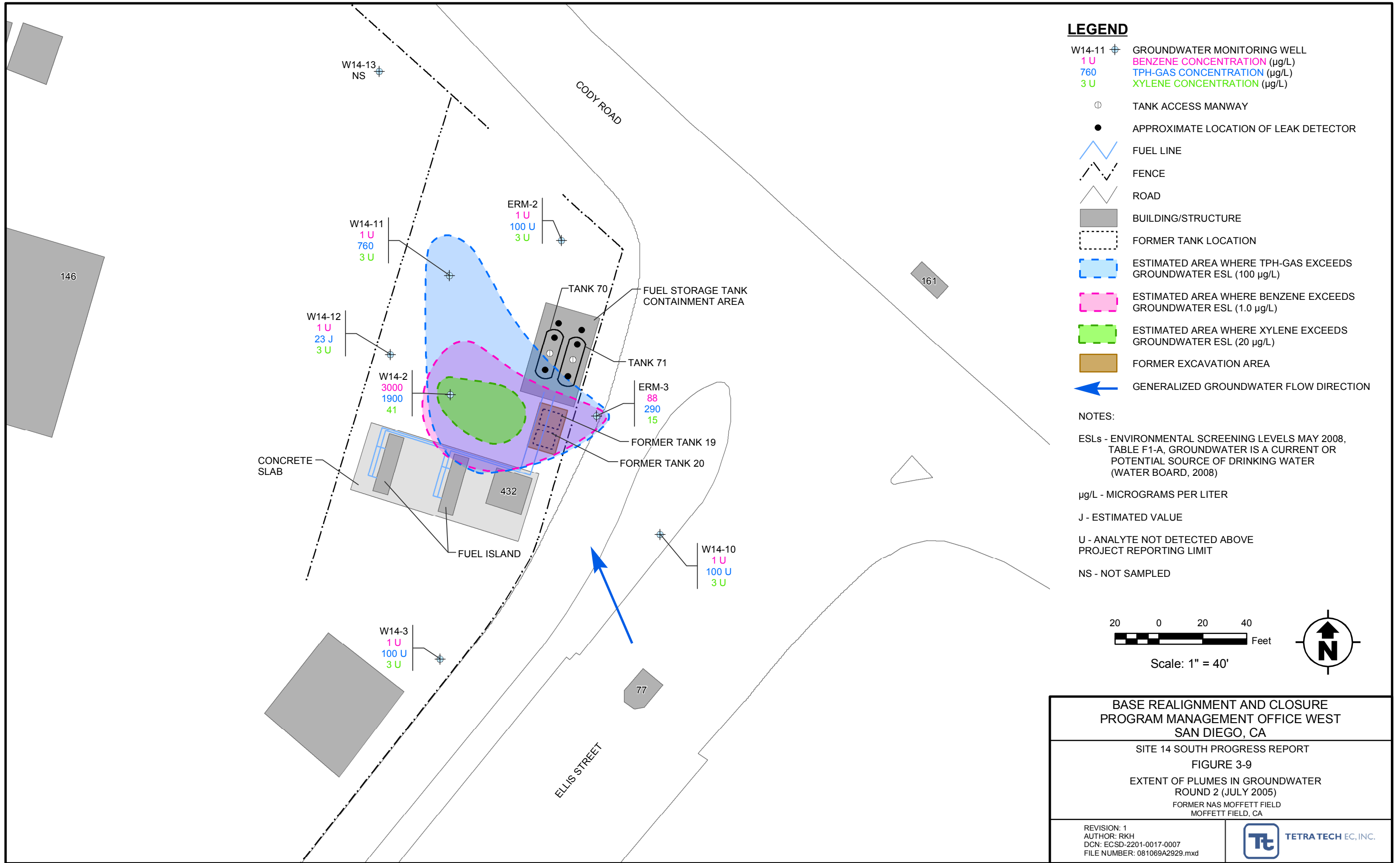
BTEX compounds and TPH-gas were not detected above the project reporting limit in samples collected from wells ERM-2, W14-3, W14-10, and W14-13. Ethylbenzene and toluene were not detected above the project reporting limit in the sample collected from W14-11. BTEX compounds were not detected above the project reporting limit in the sample collected from W14-12. MTBE was not detected above the project reporting limit in any samples collected during the round 3 sampling event.

Ethylbenzene, toluene, and xylene were detected at concentrations below their respective ESL in samples collected from well ERM-3. Xylene was detected at a concentration below its ESL in a sample collected from W14-11. TPH-gas was detected at a concentration below its ESL in a sample collected from well W14-12.

The following details the detected concentrations above their respective ESL during round 3 sampling:

- Benzene was detected at concentrations of 62 µg/L and 8,900 µg/L in samples collected from wells ERM-3 and W14-2, respectively.
- Ethylbenzene was detected at a concentration of 43 µg/L in a sample collected from well W14-2.
- Toluene was detected at a concentration of 43 µg/L in a sample collected from well W14-2.
- Xylene was detected at a concentration of 130 µg/L in a sample collected from well W14-2.
- TPH-gas was detected at concentrations of 240 µg/L, 550 µg/L, and 3,900 µg/L in samples collected from wells ERM-3, W14-11, and W14-2, respectively.

Figure 3-10 shows the interpreted area of benzene, xylene, and TPH-gas concentrations in groundwater exceeding their respective ESL during the round 3 post-injection sampling event. Concentrations of benzene, xylene, and TPH-gas in samples collected during round 3 have rebounded to near or greater than baseline conditions.





LEGEND

- W14-11
1 U
550
.71 J
- ⊕ GROUNDWATER MONITORING WELL
- BENZENE CONCENTRATION (µg/L)
- TPH-GAS CONCENTRATION (µg/L)
- XYLENE CONCENTRATION (µg/L)
- ⊕ TANK ACCESS MANWAY
- APPROXIMATE LOCATION OF LEAK DETECTOR
- FUEL LINE
- - - FENCE
- ROAD
- BUILDING/STRUCTURE
- FORMER TANK LOCATION
- ESTIMATED AREA WHERE TPH-GAS EXCEEDS GROUNDWATER ESL (100 µg/L)
- ESTIMATED AREA WHERE BENZENE EXCEEDS GROUNDWATER ESL (1.0 µg/L)
- ESTIMATED AREA WHERE XYLENE EXCEEDS GROUNDWATER ESL (20 µg/L)
- FORMER EXCAVATION AREA
- ← GENERALIZED GROUNDWATER FLOW DIRECTION

NOTES:

ESLs - ENVIRONMENTAL SCREENING LEVELS MAY 2008, TABLE F1-A, GROUNDWATER IS A CURRENT OR POTENTIAL SOURCE OF DRINKING WATER (WATER BOARD, 2008)

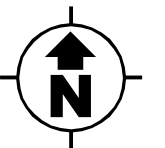
µg/L - MICROGRAMS PER LITER

J - ESTIMATED VALUE

U - ANALYTE NOT DETECTED ABOVE PROJECT REPORTING LIMIT



Scale: 1" = 40'



BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-10

EXTENT OF PLUMES IN GROUNDWATER
ROUND 3 (OCTOBER 2005)

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CA

REVISION: 1
AUTHOR: RKH
DCN: ECSD-2201-0017-0007
FILE NUMBER: 081069A2928.mxd



Data for major cations (calcium, iron, magnesium, potassium, and sodium) and anions (bicarbonate, carbonate, chloride, nitrate/nitrite-nitrogen, phosphate, and sulfate) were also collected during round 3 to determine the geochemistry of groundwater in Site 14 South monitoring wells, and whether there is any geochemical difference between the monitoring wells.

The accuracy of the analyses of major constituents in groundwater is evaluated by calculating the cation-anion balance, which compares the sum of the cations in milliequivalents per liter (meq/L) to the sum of anions in meq/L. Since major constituents in groundwater have an analytical accuracy of 2 to 10 percent (Hem, 1989), cation-anion balances less than 10 percent indicate that the accuracy of analytical results is acceptable for their use in data evaluation. Table 3-3 provides the results of the cation-anion balance, which indicate values ranging from 2.7 to 14.1 percent. The result of 14.1 percent is because of an extremely low estimated concentration of sulfate in a sample collected from well W14-2 (see Table 3-2). Analytical reports were reviewed to confirm the estimated sulfate concentration (see Appendix E, provided on CD only). Although the sample collected from well W14-2 was run with a different batch that had different detection limits based on dilution factors, the result was validated and considered accurate. With this exception, the remaining cation-anion balances are less than 9 percent, which are within the acceptable range for accuracy.

Major cation and anion data were evaluated using Rockware[®] software. A Piper plot for the round 3 post-injection sampling event is presented on Figure 3-11. Piper plots provide a snapshot of the cation and geochemistry relative to the percent abundance of each ionic species. The Piper plot shows that all wells, except W14-2, cluster within a single area, thus indicating that wells at Site 14 South exhibit similar geochemistry. Spatially, groundwater geochemistry shows no variability.

3.3.5 Round 4 Post-injection Groundwater Sampling

Groundwater samples were collected from eight wells during round 4 sampling on January 16 and 17, 2006. Table 3-2 provided the results of round 4 groundwater sampling. Groundwater sampling data sheets are provided in Appendix D (provided on CD only). Appendix E contains the laboratory analytical data sheets (provided on CD only).

BTEX compounds and TPH-gas were not detected above the project reporting limit in samples collected from wells ERM-2, ERM-3, W14-3, W14-10, W14-12, and W14-13. MTBE was not detected above the project reporting limit in any samples collected during the round 4 sampling event.

Ethylbenzene and toluene were detected at concentrations below their respective ESL in samples collected from well W14-2.

The following details the detected concentrations above the ESLs during round 4 sampling:

- Benzene was detected at concentrations of 8,200 µg/L and 31 µg/L in the samples collected from wells W14-2 and W14-11, respectively.
- Xylene was detected at a concentration of 120 µg/L in a sample collected from well W14-2.
- TPH-gas was detected at concentrations of 2,900 µg/L and 270 µg/L in the samples collected from wells W14-2 and W14-11, respectively.

Figure 3-12 shows the interpreted area of benzene, xylene, and TPH-gas concentrations in groundwater exceeding their respective ESL during the round 4 post-injection sampling event. Although concentrations of benzene, xylene, and TPH-gas in samples collected during round 4 confirm that rebound occurred to near baseline conditions, the size of the groundwater contaminant plume contracted. The sample from well ERM-3 previously had benzene and xylene results exceeding the ESLs; during round 4, however, all chemical of concern (COC) results were not detected above the project reporting limit. Although the concentration of TPH-gas in the sample collected from well W14-11 during round 4 decreased, the concentration was greater than the 100 µg/L ESL for TPH-gas.

3.4 EFFECTIVENESS OF MODIFIED FENTON'S REAGENT

ISCO, using modified Fenton's Reagent, initially appeared successful in reducing petroleum hydrocarbon concentrations. Round 1 concentrations of TPH-gas, benzene, and xylene were significantly lower than pre-injection concentrations in samples collected from wells ERM-3 and W14-2. Round 2 and 3 sample results indicated TPH-gas, benzene, and xylene concentrations had rebounded to near or above pre-injection concentrations. Round 4 TPH-gas, benzene, and xylene concentrations in samples collected from wells ERM-3 and W14-2 generally decreased from round 3 concentrations. The modified Fenton's Reagent is fast acting. The decrease in petroleum hydrocarbon concentrations observed in round 1 sample results is attributed to modified Fenton's Reagent injection. Although some post-injection concentration rebound was expected, rebound to concentrations at or above pre-injections levels was not. A sustained decrease in petroleum hydrocarbon concentrations was expected, but not observed. The decrease observed in round 4 TPH-gas, benzene, and xylene concentrations cannot be attributed to the modified Fenton's Reagent injection.

In accordance with the CAP (TtFW, 2004a) and the Addendum to the CAP (TtFW, 2004b), up to three injection events would be required to account for continued soil desorption and groundwater chemical rebound that was likely to occur after each injection event. However, because a sustained decrease in concentrations was expected but not observed, planned additional Fenton's Reagent injection events were not completed.

SITE 14 SOUTH PROGRESS REPORT

TABLE 3-3

CATION/ANION BALANCE IN SITE 14 SOUTH GROUNDWATER

Well	Sodium	Potassium	Calcium	Magnesium	Chloride	Bicarbonate	Carbonate	Sulfate	Iron	Ion Balance %
ERM-2	36.3	1.99 U	221 J	67.1	35.2	539	5 U	289	1.3	6.7
ERM-3	32.1	2.30 U	202 J	72.7	33.8	504	5 U	309	1.94	5.5
W14-10	28.4	3.38 U	261 J	105	34.8	409	5 U	658	0.1 U	3.4
W14-11	35.9	2.65 U	218 J	88.7	31.1	557	5 U	342	0.1 U	7.1
W14-12	30.9	2.08 U	236 J	87	37.1	404	5 U	555	0.657	2.7
W14-13	34.2	1.89 U	222 J	89.7	31.3	447	5 U	443	2.57	6.7
W14-2	47.5	1.48 U	198 J	56.2	19.3	728	5 U	0.485 J	3.93	14.1
W14-3	35.3	5 U	157 J	47.4	45.9	304	5 U	234	1.07	8.7
W14-3 (DUP)	33.4	3.54 U	153 J	43.8	46.3	289	5 U	236	0.977	7.3

Notes:

All values in milligrams per liter.

Abbreviations and Acronyms:

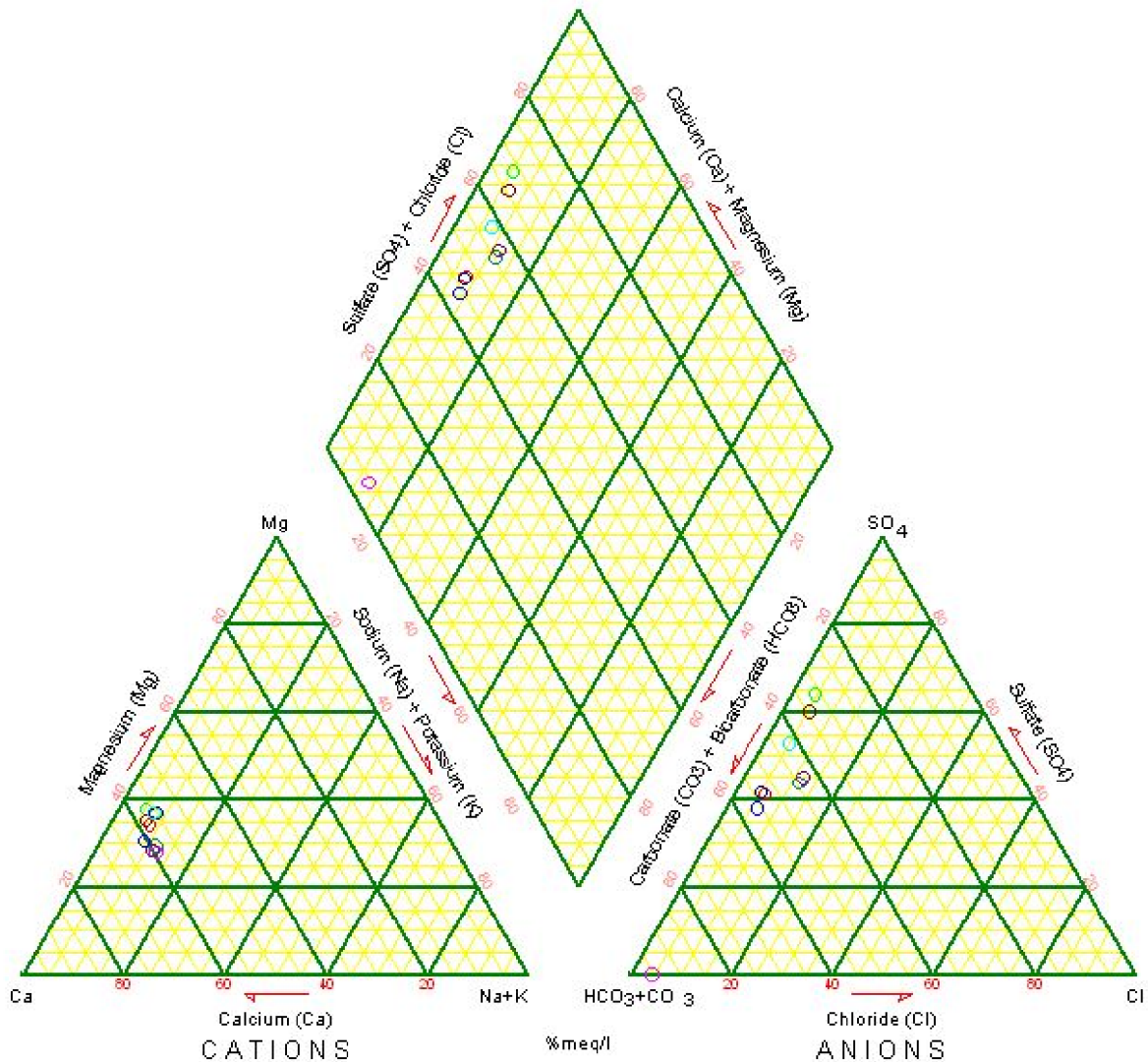
DUP - duplicate sample

J - estimated value

U - analyte not detected above the project reporting limit

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Piper Diagram



BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CALIFORNIA

SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-11

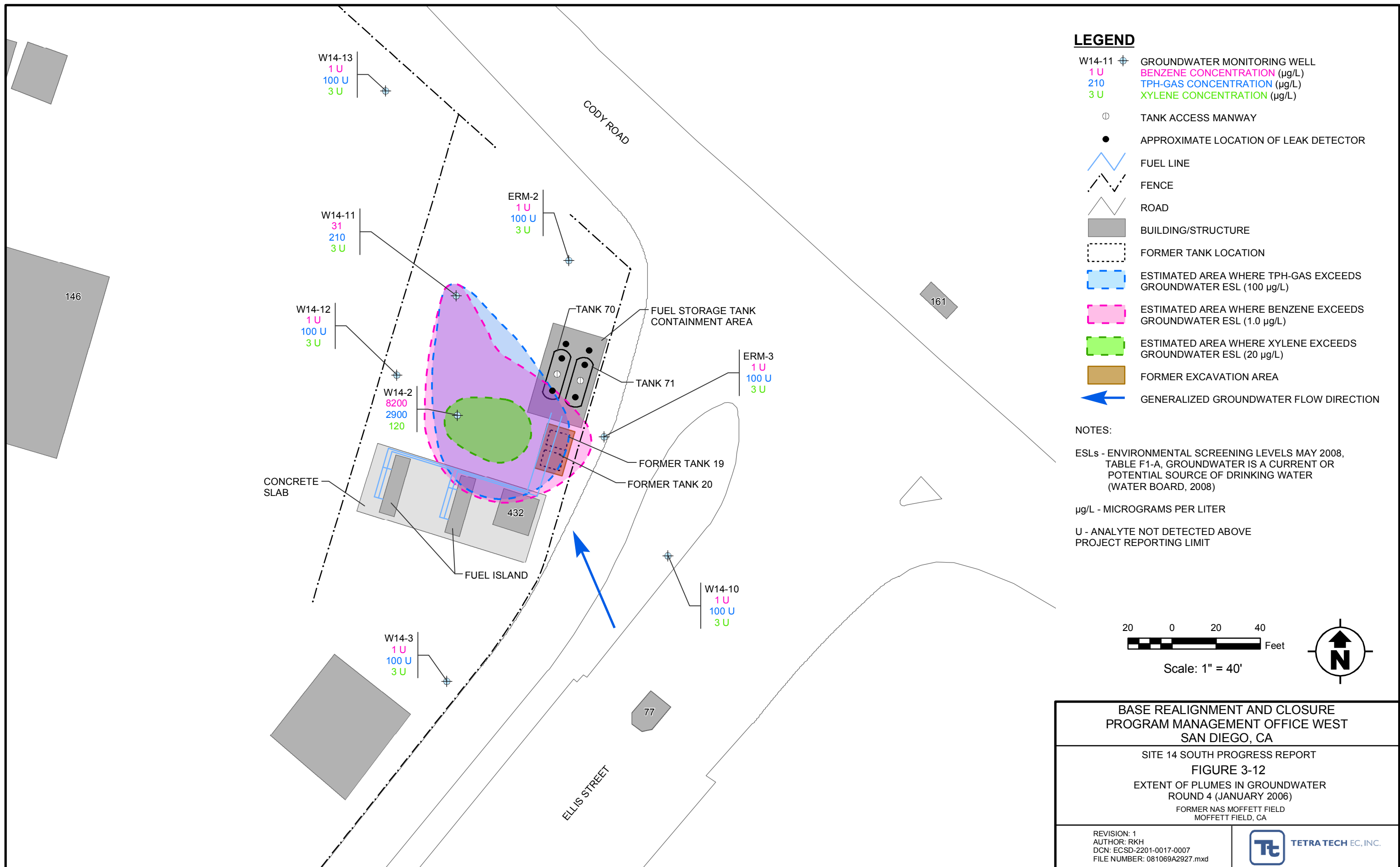
PIPER DIAGRAM

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

REVISION: 0
AUTHOR: GFG
DCN: ECSD-2201-0017-0007
FILE NUMBER: 081069T3305.mxd



TETRA TECH EC, INC.



COCs were not detected above the project reporting limit in samples collected from wells ERM-2, W14-10, and W14-3 throughout the groundwater monitoring program (see Table 3-2). Estimated concentrations of TPH-gas were detected in samples collected from well W14-12 in rounds 2 and 3, but were not detected above the project reporting limit in the baseline, round 1, or round 4 sampling events. The estimated concentrations of TPH-gas were well below the ESL and are considered to be caused by the ISCO injection (see Section 3.3.3). Concentrations of benzene, xylene, and TPH-gas were detected above their respective ESL in samples collected from wells ERM-3, W14-11, and W14-2. The following sections provide a discussion of the concentrations of the COCs above their respective ESL in each well.

ERM-3

Figure 3-13 is a time series plot of benzene, and TPH-gas concentrations in samples collected from well ERM-3. The benzene and TPH-gas concentrations exhibit similar behavior historically and subsequent to ISCO. Historically, concentrations of benzene have fluctuated above the ESL. Concentrations of benzene exceeded the ESL during the baseline and first three rounds of post-injection sampling. Concentrations of benzene were not detected above the project reporting limit during round 4. Concentrations of TPH-gas have fluctuated above and below the ESL since September 2001. Concentrations of TPH-gas were not detected above the project reporting limit during round 4.

Historically, concentrations of xylene in samples collected from well ERM-3 have been below the ESL. Concentrations of xylene were not detected above the project reporting limit in round 4.

Immediately following ISCO using modified Fenton's Reagent (round 1), concentrations of benzene and TPH-gas were reduced by approximately 65 and 85 percent, respectively. Although concentrations of benzene and TPH-gas rebounded to near or above baseline conditions during round 2 and round 3 sampling, they were not detected above the project reporting limit in round 4. The post-rebound reduction in concentrations observed in round 4 is not considered to be attributed to the modified Fenton's Reagent injection.

Well W14-11

Figure 3-14 is a time series plot of benzene and TPH-gas concentrations in samples collected from well W14-11. Historically, benzene had not been detected above the project reporting limit in samples collected from well W14-11 since 1997. A benzene concentration exceeded its ESL in the sample collected from well W14-11 during round 4 post-injection sampling. The spike in benzene may be a result of the ISCO injection (see Section 3.3.3). Historically, concentrations of TPH-gas in samples collected from well W14-11 have all been above the ESL. Concentrations of TPH-gas were detected above the ESL during the baseline and all subsequent rounds of post-injection sampling. Concentrations of TPH-gas spiked during rounds 2 and 3, which is considered to be caused by the ISCO injection (see Section 3.3.3).

Immediately following ISCO using modified Fenton's Reagent (round 1), the concentration of TPH-gas was reduced by approximately 30 percent. However, the concentration of TPH-gas spiked during round 2 and 3. It appears that ISCO using modified Fenton's Reagent temporarily may have enhanced the migration of contamination along the flow line at Site 14 South.

Well W14-2

Figure 3-15 is a time series plot of benzene and TPH-gas concentrations in samples collected from well W14-2. Historically, concentrations of benzene have been above the ESL. The benzene and TPH-gas concentrations exhibit similar behavior subsequent to ISCO injection. Well W14-2 is the "hot spot" well at Site 14 South. Concentrations of benzene exceeded the ESL during the baseline and all four rounds of post-injection sampling. Historically, concentrations of TPH-gas have been above the ESL. Concentrations of TPH-gas exceeded the ESL during the baseline and all four rounds of post-injection sampling.

Figure 3-16 is a time series plot of xylene concentrations in samples collected from well W14-2. Historically, concentrations of xylene have been above the ESL. Concentrations of xylene exceeded the ESL during the baseline and all four rounds of post-injection sampling.

Immediately following ISCO, using modified Fenton's Reagent (round 1), concentrations of benzene, TPH-gas, and xylene were significantly reduced by approximately 80, 65, and 80 percent, respectively. However, concentrations of benzene, TPH-gas, and xylene increased slightly in round 2 and ultimately rebounded to near or above baseline conditions during round 3, then decreased in round 4. ISCO, using modified Fenton's Reagent, was not successful in creating sustained reductions in benzene, TPH-gas, or xylene concentrations at "hot spot" well W14-2.

3.5 CONCLUSIONS

Groundwater sampling data continue to demonstrate that there does not appear to be any upgradient source(s) of petroleum hydrocarbons contributing to the soil/groundwater contamination found at Site 14 South.

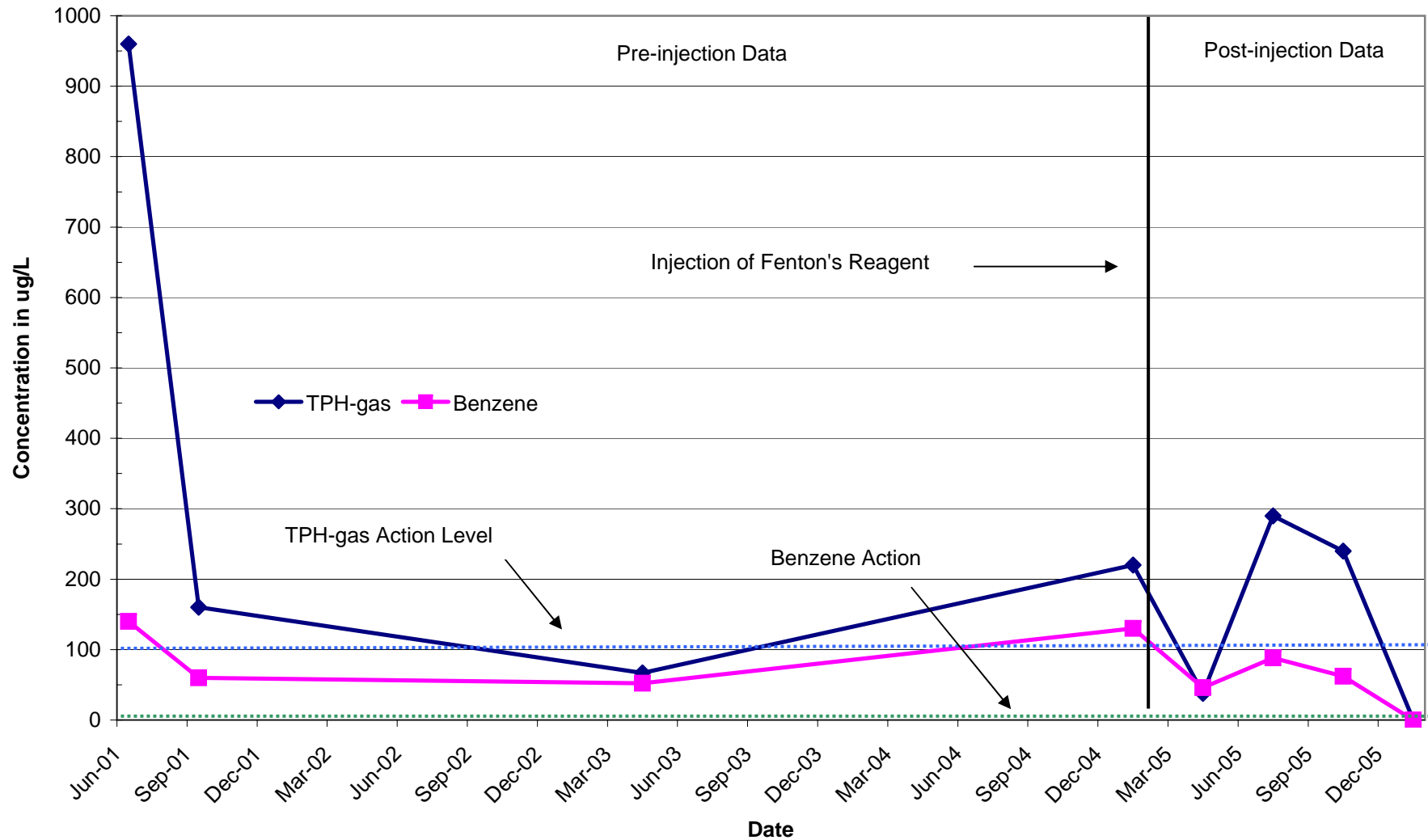
Data for major cations and anions were also collected during round 3 in order to determine the geochemistry of groundwater in Site 14 South monitoring wells. The Piper plot (see Figure 3-11) shows that all wells cluster within a single area, thus indicating that wells at Site 14 South exhibit similar geochemistry. Spatially, groundwater geochemistry shows no variability.

According to bench scale testing, sustained reductions in groundwater petroleum hydrocarbon concentrations were expected after the initial Fenton's Reagent injection. Significant reductions of petroleum hydrocarbon concentrations were observed in round 1 sampling compared to pre-injection concentrations. However, by round 3, TPH-gas and xylene concentrations had

SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-13

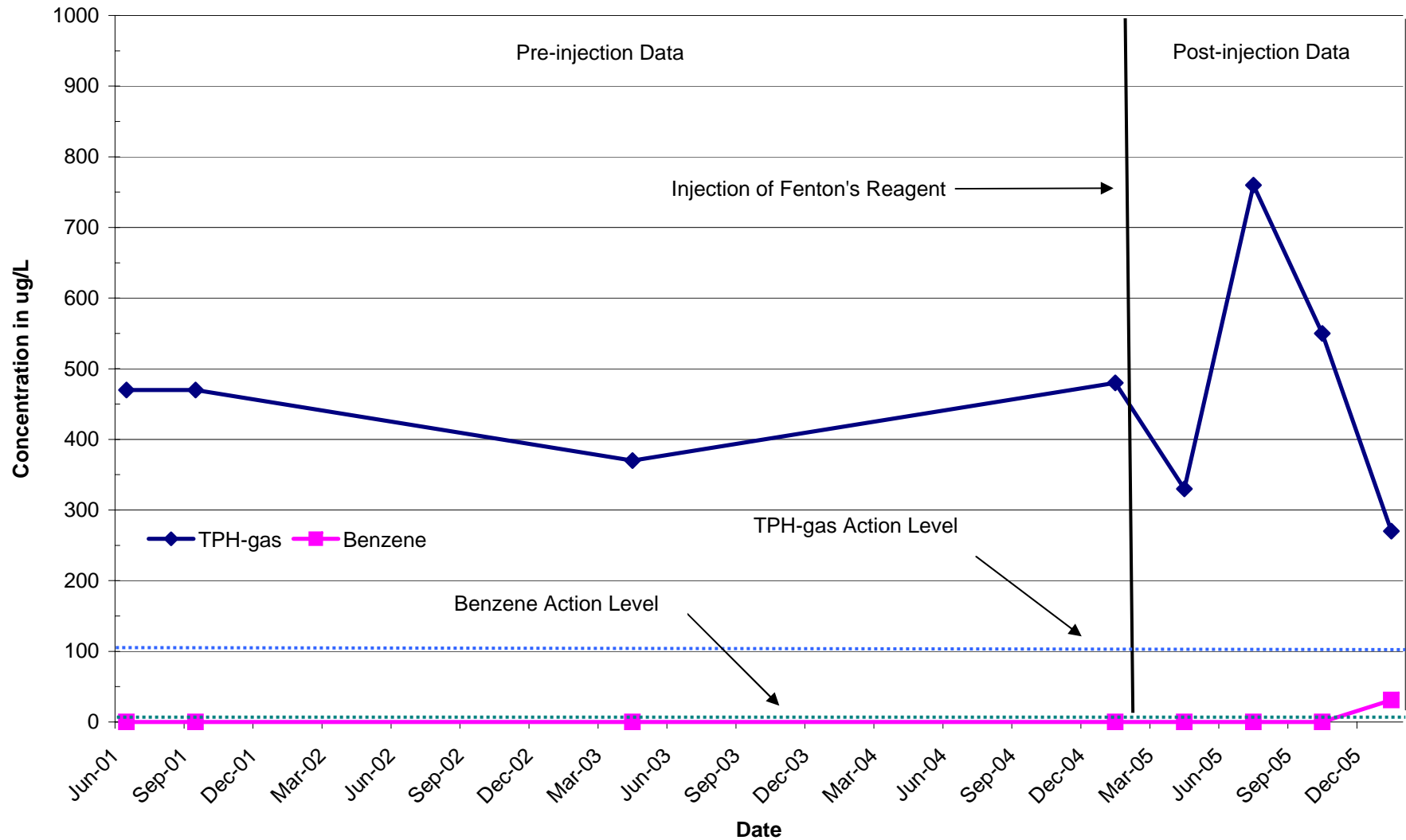
TIME SERIES CONCENTRATIONS OF BENZENE AND TPH-GAS, ERM-3



SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-14

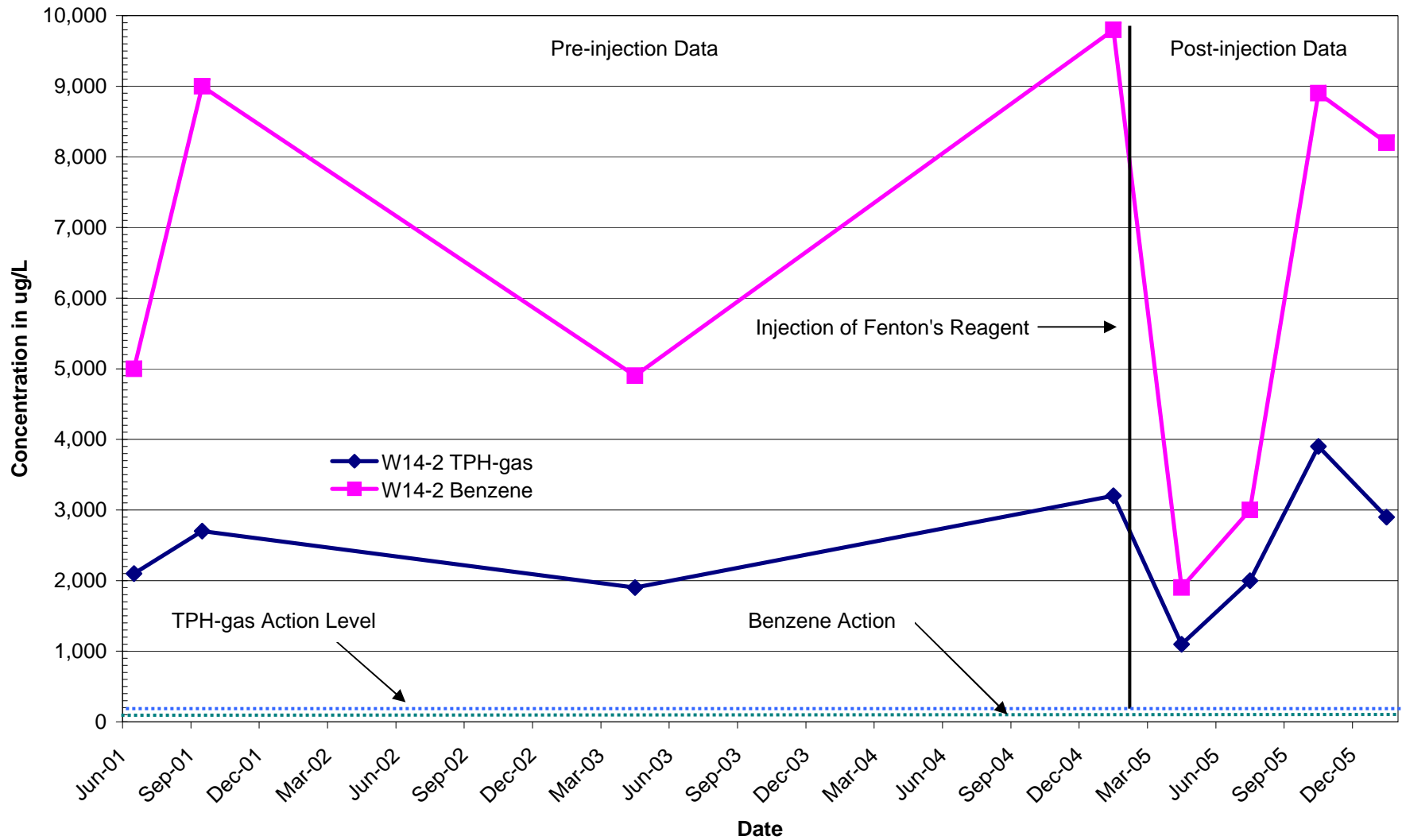
TIME SERIES CONCENTRATIONS OF BENZENE AND TPH-GAS, W14-11



SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-15

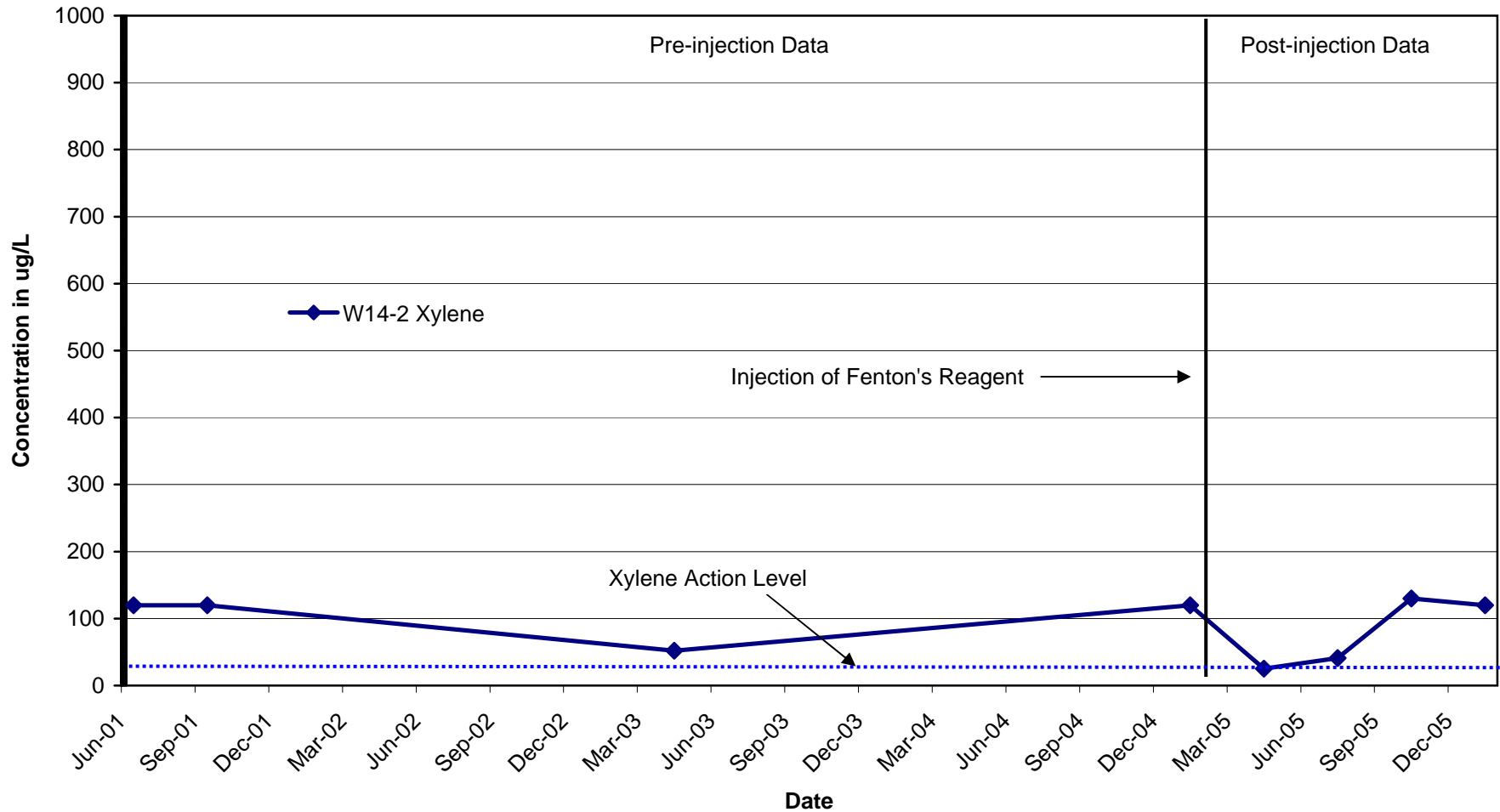
TIME SERIES CONCENTRATIONS OF BENZENE AND TPH-GAS, W14-2



SITE 14 SOUTH PROGRESS REPORT

FIGURE 3-16

TIME SERIES CONCENTRATIONS OF XYLENE, W14-2



rebounded to levels equal to or greater than pre-injection concentrations. Based on the greater than expected rebound of TPH-gas and xylene concentrations, additional Fenton's Reagent injections events were not completed as originally planned. ISCO using Fenton's Reagent did not achieve results similar to bench scale tests, and thus was likely to be ineffective at achieving project objectives.

Additional corrective action is required to reduce the contamination at Site 14 South. The Navy is conducting additional actions at Site 14 South according to the final *Addendum No. 2 to Site 14 South Corrective Action Plan and Associated Work Plan for Underground Storage Tank Integrity Testing and Additional Site Assessment* (Battelle, 2008).

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4.0 REFERENCES

- Battelle. 2008. *Final Addendum No. 2 to Site 14 South Corrective Action Plan and Associated Work Plan for Underground Storage Tank Integrity Testing and Additional Site Assessment*. Former Naval Air Station Moffett Field, Moffett Field, California. February 13.
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- _____. 2008. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*. Interim Final, November; Revised May.
- Tetra Tech FW, Inc. (TtFW). 2004a. *Final Site 14 South Corrective Action Plan and Associated Work Plan*. Former Naval Air Station Moffett Field, Moffett Field, California. May 25.
- _____. 2004b. *Final Addendum to Site 14 South Corrective Action Plan and Associated Work Plan*. Former Naval Air Station Moffett Field, Moffett Field, California. October 1.
- Water Board (California Regional Quality Control Board). 1990. *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*. August.

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APPENDIX A

PROJECT PHOTOGRAPHS

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Photograph 1: Baseline Groundwater Sampling



Photograph 2: Utility Clearance



Photograph 3: Hand-augering to 5 Feet Below Ground Surface



Photograph 4: Direct Push Technology Boring for Modified Fenton's Reagent Injection



Photograph 5: Staging Area for Hydrogen Peroxide and Iron Catalyst



Photograph 6: Injection Points



Photograph 7: Injection Apparatus with Pressure Gauge



Photograph 8: Monitoring Field Parameters During Injection



Photograph 9: Site Restoration



Photograph 10: Collecting Post-injection Groundwater Samples

APPENDIX B

BENCH-SCALE LABORATORY TREATABILITY STUDY

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TREATABILITY STUDY REPORT

**MOFFETT FIELD SITE
CODY ROAD AND ELLIS STREET
SUNNYVALE, CALIFORNIA**

SEPTEMBER 21, 2004

PREPARED FOR

**TETRA TECH FW, INC.
302 RESEARCH DRIVE
NORCROSS, GA 30092**

PREPARED BY

**IN-SITU OXIDATIVE TECHNOLOGIES, INC.
51 EVERETT DRIVE, SUITE A-10
WEST WINDSOR, NEW JERSEY 08550**

ISOTEC PROJECT No. 800781

TABLE OF CONTENTS

<i>Section 1</i>	<i>Executive Summary.....</i>	<i>1</i>
<i>Section 2</i>	<i>Study Objectives.....</i>	<i>2</i>
<i>Section 3</i>	<i>Sample Collection and Preparation.....</i>	<i>3</i>
<i>Section 4</i>	<i>Laboratory Treatability Study.....</i>	<i>4</i>
4.1	Experimental Setup.....	4
4.1.1	GW-test	4
4.1.2	SL-test	4
4.2	Establishing Experimental Controls	4
4.3	Conducting Experiments.....	5
4.3.1	Application of Reagent.....	5
4.4	Analytical Sample Collection and Chemical Analysis	6
4.4.1	GW-test	6
4.4.2	SL-test	6
<i>Section 5</i>	<i>Treatability Study Results</i>	<i>7</i>
5.1	GW-test	7
5.2	SL-test	8
<i>Section 6</i>	<i>Conclusion and Recommendations</i>	<i>9</i>

TABLES

INITIAL CONDITIONS	TABLE 1
GW-TEST RESULTS	TABLE 2
SL-TEST RESULTS	TABLE 3

APPENDICES

LAB STUDY ANALYTICAL DATA PACKAGES	APPENDIX 1
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Section 1 Executive Summary

In-Situ Oxidative Technologies, Inc. (ISOTECSM) was retained by TetraTech FW, Inc. (TtFW) to conduct an in-situ chemical oxidation (ISCO) bench-scale laboratory treatability study (study) on soil and groundwater samples collected from the Moffett Field (MF) site located in Sunnyvale, California. The purpose of the study was to determine the potential effectiveness of ISOTEC's modified Fenton's process to treat contaminants of concern (COCs) in soil and groundwater at the site. The targeted COCs for the study are volatile organic compounds (VOCs), primarily benzene, toluene, ethylbenzene and xylenes (BTEX), and total petroleum hydrocarbons (TPH) as gasoline ranged organics (GRO). The modified Fenton's process uses a proprietary catalyst and hydrogen peroxide to produce free radicals that attack organic contaminants, and thus reduce/cleanup contamination in the subsurface environment.

Experiments of the treatability study were conducted on (a) groundwater samples (GW-test) and (b) slurry samples that are a mixture of site soil and groundwater prepared into a 3:1 slurry by weight (SL-test).

Results of the treatability study indicated that effective treatment and significant contaminant destruction were achieved in both groundwater and slurry samples. Summary results are provided in the table below.

Percent Contaminant Reduction

	Total BTEX	TPH-GRO
GW-test	>99%	>99%
SL-test	72% - 96%	37% - 68%

Based on the above results, ISOTEC recommends a field pilot study to further evaluate the effectiveness of the modified Fenton's Process.

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Section 2 Study Objectives

The objectives of the study were as follows:

- Evaluate the COC treatment effectiveness of the reagent on site groundwater sample and the slurry sample; and
- Determine the most effective reagent dosage for a potential pilot scale application at the site.

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Section 3 Sample Collection and Preparation

TtFW personnel collected groundwater and soil samples at various depths from the site and shipped the samples to the ISOTEC facility for the treatability study. The groundwater sample was collected from monitoring well W14-2 on August 2, 2004 (ID: 86-S14). The soil sample was collected on June 24, 2004 from direct push point number 22 (i.e. DP-22). Soils collected from 8 to 10 feet below ground surface (ID: 86-S14-005) were selected for use in the study as it contained the highest COC concentrations (based on previous analytical data). Prior to initiating the study, the soils were first screened to remove rock fragments and debris and composited via thorough mixing. Then, a portion of the composited soil sample was sub-sampled and submitted for total iron, manganese, and total organic carbon (TOC) analyses to gather the initial characteristic data of the sample. Similarly, a portion of groundwater sample was sub-sampled and submitted for BTEX, TPH-GRO, dissolved iron and manganese analyses. Integrated Analytical Laboratories, LLC (IAL), a New Jersey certified analytical laboratory performed analyses. The analytical results are presented in Table 1. The remaining sample(s) was then used to prepare experimental samples for the treatability study.

Experimental samples were in two forms: aqueous and slurry. The aqueous samples were directly prepared from the groundwater sample (86-S14) as received. The slurry samples were prepared by mixing soil (86-S14-005) with groundwater (86-S14) at a ratio of three-to-one (3:1, three parts of soil to one part of groundwater) by weight. A portion of slurry was sub-sampled for BTEX and TPH-GRO analyses to gather the data on the initial condition of the slurry. Results of the initial conditions of the slurry are also included in Table 1.

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Section 4 Laboratory Treatability Study

Treatability study experiments were conducted on aqueous and slurry samples, hereinafter referred to as groundwater test (GW-test) and slurry test (SL-test), respectively. Each test was comprised of two experiments: BTEX and TPH-GRO. Each experiment further consisted of the following four steps:

1. Experimental setup,
2. Establishing experimental control,
3. Conducting the experiments, and
4. Analytical sample collection and analyses.

Procedures used during each step were mostly similar for both BTEX and TPH-GRO experiments. Therefore, the following discussion applies to both experiments unless noted otherwise.

4.1 Experimental Setup

4.1.1 GW-test

The BTEX and TPH-GRO experiments were independently performed in four (4) 140-ml glass reactors. One of the four reactors served as the “control” reactor (see Section 4.2 below) while the remaining three as treatment reactors. Exactly 125 ml of groundwater was introduced into each reactor leaving enough headspace for injection of reagent. The reactors were sealed with crimp-top aluminum caps fitted with rubber septa to facilitate reagent injections.

4.1.2 SL-test

A total of five (5) reactors were utilized in the SL-test, a “control” reactor and four treatment reactors. All reactors used in the SL-test were 120 ml glass jars sealed with screw top caps fitted with septa to facilitate reagent injections. Exactly 40 g of slurry was introduced into each reactor leaving enough headspace for injection of reagent.

4.2 Establishing Experimental Controls

Experimental control samples were set up during the study for both GW-test and SL-test to document the following:

- reduction or changes in concentrations of the target constituents due to sample dilution by reagent volumes injected, and

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- reduction in concentrations of the target constituents due to volatilization caused by room temperature test conditions.

The control sample was set up exactly the same way, remained at, and was subject to the same conditions as the associated treatment reactors. However, the control reactor was injected with distilled water instead of reagent (see Section 4.3 below). The volume of distilled water injected was identical to the volumes of reagent injected into the treatment reactors.

4.3 Conducting Experiments

The experiment was conducted through application of ISOTEC reagent on the experimental reactors and the procedures for reagent application are the same for both GW-test and SL-test. ISOTEC reagent is a mixture of catalyst and oxidizer. The catalyst used in the experiments was ISOTEC's patented Catalyst 4260 (Cat-4260) and the oxidizer was stabilized hydrogen peroxide.

Catalyst 4260 is a circum-neutral pH (e.g. 5-8) organometallic complex with high mobility within the subsurface. Based on historical contaminant levels noted at the site and previous experience with treatment of the compounds of concern, ISOTEC selected this catalyst for the experiments. The stoichiometric molar ratio of Catalyst 4260 to measured site contaminants was determined and then used to prepare the Catalyst 4260 containing reagents. Historical groundwater data from the site was also reviewed and considered in the determination of reagent dosage to be used in the study.

4.3.1 Application of Reagent

As discussed in Section 4.1, each experiment contained a control reactor and three (GW-test) or four (SL-test) treatment reactors. The predetermined reagent dosage was injected into each treatment reactor as small incremental dosages. For the SL-test, the treatment reactors received one, three or five dosages, respectively to represent low, medium, or high treatment conditions. Each dosage provided an equivalent hydrogen peroxide concentration of 1.4% in the soil being treated. For the GW-test, the treatment reactors received one, two or three dosages in the GW-test to represent low, medium, and high treatment conditions, respectively. Each dosage provided an equivalent hydrogen peroxide concentration of 0.45% in the groundwater being treated. The multiple dosage approach (incremental approach) was used to increase treatment efficiency, minimize gas formation and the resulting pressure buildup. Distilled water was used to compensate the difference of reagent volumes applied between reactors. The control reactor received an equivalent volume of distilled water instead of reagent. A time gap of approximately 24 hours was maintained between dosages.

Following the last application of reagent, all reactors remained undisturbed at room temperature for a minimum of 24 hours or until the oxidizer (H_2O_2) was completely

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consumed as determined by H₂O₂ analyses. The reaction was quenched using catalase, which is an organic enzyme catalyst naturally present in most soils that decomposes hydrogen peroxide directly to oxygen without generating hydroxyl radicals as shown below.



After the resting period, excess catalase was injected into each reactor to decompose any residual hydrogen peroxide and terminate the study. The use of catalase for quenching purposes is standard practice in Fenton's chemistry and does not interfere with laboratory analysis. For the purpose of consistency, the exact volume of excess catalase injected into each treatment reactor was also injected into the control reactor.

4.4 Analytical Sample Collection and Chemical Analysis

4.4.1 GW-test

Contents of all the reactors (control and treatment) from the GW-test BTEX and TPH-GRO experiments were independently decanted into 40-ml vials preserved with hydrochloric acid (HCl) and submitted for BTEX and TPH-GRO analyses by EPA method 624.

4.4.2 SL-test

All reactors (initial, control and treatment) from the SL-test were submitted "as is" in the experimental containers for BTEX (EPA method 8260B) and TPH-GRO (EPA method 8015B) analyses.

IAL performed analyses on all of the study samples including initial, control and treatment samples. Analytical results are tabulated in Table 1 for initial conditions, Table 2 for GW-test and Table 3 for SL-test. Laboratory reports including chains-of-custody are provided in Appendix 1.

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Section 5 Treatability Study Results

Results of the experiments are presented in Tables 2 and 3 and discussed in this section. Treatment effectiveness is evaluated by comparison of treated sample data with the control sample data. As discussed in Section 4.2, the control sample underwent the same conditions as all treated samples but received zero dosage of reagent. Therefore, the differences in contaminant concentrations between the treated samples and the control sample best represent the treatment effectiveness. For discussion purpose, all non-detect (ND) values are assumed to be equal to zero in the contaminant reduction calculation.

The pH measurements show the final pH values of the treatment samples varied between 6.59 and 6.71 standard units (SU) for GW-test and between 6.81 to 7.38 SU for SL-test following application of reagent. Therefore, the oxidative reactions took place under circum-neutral conditions (i.e. pH 5-8), which is desirable for field applications.

5.1 Initial Conditions

A preliminary assessment of site-specific factors that could affect the ISOTEC modified Fenton's study was performed on the content of iron and manganese in site soil and groundwater and TOC in site soil (Table 1). Iron and manganese were detected in site soil at 28,500 mg/kg and 720 mg/kg. However, the bulk of iron and manganese is bound to the soil matrix and unavailable to catalyze a Fenton's reaction that typically occurs in the dissolved phase. The dissolved iron and manganese in groundwater were present at a concentration of less than 0.1 mg/l (iron) and 0.635 mg/l (manganese). These concentrations are too low to function as naturally occurring catalyst for the Fenton's reactions. The concentration of TOC in soil was at 13,500 mg/kg, which includes the petroleum contamination, is moderately high, and may promote side reactions that compete for hydroxyl radicals. However, supplying additional reagent volumes will offset reagent losses due to such competition.

5.2 GW-test

The data in Table 2 indicates that the modified Fenton's process has promoted effective treatment of BTEX and TPH-GRO contamination in the groundwater sample. Contaminant destruction reached greater than 99% for both BTEX and TPH-GRO experiments following only one treatment dosage. Total BTEX was detected in the control sample at a cumulative concentration of 2,050 ug/l. Individual BTEX compounds were all treated to non-detectable levels (ND) to below their respective laboratory method detection limit (MDL) in all three treatment reactors. TPH-GRO was also treated

In-Situ Oxidative Technologies, Inc.

to ND in all three treatment reactors from a concentration of 5.18 ug/l in the control sample.

5.3 SL-test

Slurry sample contained much higher contaminant concentrations compared to the groundwater sample. A concentration of 49,175 ug/kg of total BTEX and 232,000 ug/kg of TPH-GRO was detected in the control sample. The BTEX concentration was reduced to 2,110 ug/kg and TPH-GRO to 74,300 ug/kg after 3 treatment dosages. Overall results indicate a contaminant reduction ranging from 72% to 96% for BTEX and from 37% to 68% for TPH-GRO.

In-Situ Oxidative Technologies, Inc.

Section 6 Conclusion and Recommendations

The treatability study results indicate that the modified Fenton's process is effective in treating the site contamination. The study achieved maximum contaminant reduction for BTEX and TPH-GRO (greater than 99% for both) in the groundwater sample. The slurry sample contained much higher contamination than the groundwater sample. However, significant contaminant removal was also achieved in the SL-test. Contaminant removal reached up to 95% for total BTEX and 68% for TPH-GRO in the SL-test. All treatment reactions took place under circum-neutral pH conditions (5-8) in both GW-test and SL-test, which is desirable for field application.

The treatability study results indicate that the modified Fenton's process could successfully treat soil and groundwater contamination at the site. The data suggests that a pilot application of the ISOTEC modified Fenton's process should be completed at the site to gather additional data on the effectiveness of this remedial alternative on a large-scale basis under field conditions. A pilot application would also serve as an initial step towards complete site remediation.

In-Situ Oxidative Technologies, Inc.

TABLES

**Table 1: Initial Conditions
Moffett Field Site, California
ISOTEC Project #800781**

Sample ID Matrix	SL/INITIAL Sludge	86-S14 Aqueous	86-S14-005 Soil
VOCs (ppb)			
Benzene	716.00	6,130.00	~
Toluene	ND<0.691	ND<41.00	~
Ethylbenzene	19,600.00	ND<38.00	~
Total Xylenes	18,700.00	ND<118.00	~
Total BTEX (ppb)	20,316.00	6,130.00	
Hydrocarbons (ppb)			
TPH-GRO	267,000.00	17.80	~
Other Parameters (ppm)			
Iron	~	ND<0.10	28,500.00
Manganese	~	0.635	720.00
Total Organic Carbon	~	~	13,500.00

Note:

VOCs = Volatile organic compounds

BTEX = Benzene, toluene, ethylbenzene and total xylenes

TPH-GRO = Total petroleum hydrocarbon-gasoline range organics

~ = Sample not analyzed for.

ND = Analyzed for but not detected at the method detection limit (MDL) indicated by the number following "<".

ppb = Parts per billion or micrograms per kilogram or micrograms per liter.

ppm = Parts per million or milligrams per kilogram or milligrams per liter.

**Table 2: GW-Test Results
Moffett Field Site, California
ISOTEC Project #800781**

Sample ID Catalyst Used Oxidant Used No. of Treatment	GW/CONTROL Cat-4260 H2O2 0	GW/T-A Cat-4260 H2O2 1	GW/T-B Cat-4260 H2O2 2	GW/T-C Cat-4260 H2O2 3
VOCs (ppb)				
Benzene	2,030.00 D	0.75	ND<0.13	ND<0.13
Toluene	8.10	ND<0.19	ND<0.19	ND<0.19
Ethylbenzene	ND<3.20	ND<0.16	ND<0.16	ND<0.16
Total Xylenes	11.80	ND<0.38	ND<0.38	ND<0.38
Total BTEX	2,049.90	0.75	0.00	0.00
Hydrocarbons (ppb)				
TPH-GRO	5.18	ND<0.10	ND<0.10	ND<0.10
% Reduction				
Total BTEX	-	99.96%	100.00%	100.00%
TPH-GRO	-	100.00%	100.00%	100.00%
Final pH Value	6.91	6.71	6.59	6.62

Note:

VOCs = Volatile organic compounds

BTEX = Benzene, toluene, ethylbenzene and total xylenes

TPH-GRO = Total petroleum hydrocarbon-gasoline range organics

ND = Analyzed for but Not Detected at the MDL

D = The compound was reported from the Diluted analysis

ppb = Parts per billion or micrograms per kilogram or micrograms per liter.

Table 3: SL-Test Results
Moffett Field Site, California
ISOTEC Project #800781

Sample ID Catalyst Used Oxidant Used No. of Treatment	SL/CONTROL Cat-4260 H2O2 0	SL/T-A Cat-4260 H2O2 1	SL/T-B Cat-4260 H2O2 3	SL/T-C Cat-4260 H2O2 5	SL/T-D Cat-4260 H2O2 3*
VOCs (ppb)					
Benzene	575.00 J	ND<870	ND<90	ND<98	ND<85
Toluene	ND<836	ND<870	ND<180	ND<196	ND<169
Ethylbenzene	22,300.00	7,370.00	6,620.00	1,560.00	1,030.00
Total Xylenes	26,300.00	6,540.00	6,500.00	1,420.00	1,080.00
Total VOCs	49,175.00	13,910.00	13,120.00	2,980.00	2,110.00
Hydrocarbons (ppb)					
TPH-GRO	232,000.00	146,000.00	74,300.00	82,400.00	142,000.00
% Reduction					
Total VOCs	-	71.71%	73.32%	93.94%	95.71%
TPH-GRO	-	37.07%	67.97%	64.48%	38.79%
Final pH Value	7.30	7.38	6.81	6.81	6.98

Note:

VOCs = Volatile organic compounds

BTEX = Benzene, toluene, ethylbenzene and total xylenes

TPH-GRO = Total petroleum hydrocarbon-gasoline range organics

ND = Analyzed for but Not Detected at the MDL

J = Compound was detected at a concentration below its MDL

ppb = Parts per billion or micrograms per kilogram or micrograms per liter.

* = SL/T-D received the same amount of H2O2 but only half amount of Cat-4260 compared to SL/T-B.

APPENDIX #1

LAB STUDY ANALYTICAL PACKAGES



ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07595

MDL = METHOD DETECTION LIMIT

Volatiles - BTEX

Lab ID: 07595-001

Client ID: GW/CONTROL

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Benzene	2030	D	6.50
Toluene	8.10		3.80
Ethylbenzene	ND		3.20
Total Xylenes	11.8		7.60

Hydrocarbons

Lab ID: 07595-001

Client ID: GW/CONTROL

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/23/04

Compound	Conc	Q	MDL
Total Volatile Hydrocarbons(GRO)	5.18		2.00

Volatiles - BTEX

Lab ID: 07595-002

Client ID: GW/T-A

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Benzene	0.751		0.130
Toluene	ND		0.190
Ethylbenzene	ND		0.160
Total Xylenes	ND		0.380

Hydrocarbons

Lab ID: 07595-002

Client ID: GW/T-A

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/23/04

Compound	Conc	Q	MDL
Total Volatile Hydrocarbons(GRO)	ND		0.100

Volatiles - BTEX

Lab ID: 07595-003

Client ID: GW/T-B

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Benzene	ND		0.130
Toluene	ND		0.190
Ethylbenzene	ND		0.160
Total Xylenes	ND		0.380

ND = Analyzed for but Not Detected at the MDL

D = The compound was reported from the Diluted analysis



ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07595

MDL = METHOD DETECTION LIMIT

Hydrocarbons

Lab ID: 07595-003

Client ID: GW/T-B

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/23/04

Compound

Conc

Q

MDL

Total Volatile Hydrocarbons(GRO)

ND

0.100

Volatiles - BTEX

Lab ID: 07595-004

Client ID: GW/T-C

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/11/04

Compound

Conc

Q

MDL

Benzene

ND

0.130

Toluene

ND

0.190

Ethylbenzene

ND

0.160

Total Xylenes

ND

0.380

Hydrocarbons

Lab ID: 07595-004

Client ID: GW/T-C

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/9/04

Time Sampled: 11:00

Date Analyzed: 8/23/04

Compound

Conc

Q

MDL

Total Volatile Hydrocarbons(GRO)


ND

0.100

ND = Analyzed for but Not Detected at the MDL

D = The compound was reported from the Diluted analysis

These data have been reviewed and accepted by:


Michael H. Leftin, Ph.D.
Laboratory Director

Turnaround Time (starts the following day if samples rec'd at lab > 5PM)

<u>Conditional / TPHC</u>				Results needed by:	Report Format
24 hr*	48 hr	72 hr	1 wk	NA	Results Only
<u>Verbal/Fax</u>					Reduced
24 hr*	48 hr*	72 hr*	1 wk*	2 wk/Std	Regulatory
<u>Hard Copy</u>					SRP Disk**; dbf or wk1
72 hr*	1 wk*	2 wk*	3 wk/Std		Special Requirements:

*Prior to sample arrival, Lab notification is required. RUSH Surcharge will apply

ANALYTICAL PARAMETERS/PRESERVATIVES

W - Waste SL - Sludge A - Aqueous
O - Oil X - Other S - Soil
GW - Groundwater SOL - Solid

[illegible]

	Conc. Expected: Low Med High
--	------------------------------

Lab Case #:

Describe PAGE:

PROJECT INFORMATION



E 0 4 - 0 7 5 9 5

Case No. **E04-07595**Project **TTFW/MOFFET FIELD CA - 800781**

Customer Isotec	P.O. # 2636
Contact Prasad Kakarla	Received 8/9/2004 14:40
E-Mail pkakarla@insituoxidation.com <input checked="" type="checkbox"/> EMail EDDs	Verbal Due 8/23/2004
Phone (609) 275-8500 Fax 1(609) 275-9608	Report Due 8/30/2004
Report To	Bill To
51 Everett Drive	51 Everett Drive
Suite A-10	Suite A-10
West Windsor, NJ 08550	West Windsor, NJ 08550
Attn: Prasad Kakarla	Attn: Prasad Kakarla
Report Format Standard	
Additional Info <input type="checkbox"/> State Form <input type="checkbox"/> Field Sampling <input type="checkbox"/> Conditional VOA	

Lab ID	Client Sample ID	Depth Top / Bottom	Sampling Time	Matrix	Unit	# of Containers
07595-001	GW/CONTROL	n/a	8/9/2004@11:00	Aqueous	µg/L	4
07595-002	GW/T-A	n/a	8/9/2004@11:00	Aqueous	µg/L	4
07595-003	GW/T-B	n/a	8/9/2004@11:00	Aqueous	µg/L	4
07595-004	GW/T-C	n/a	8/9/2004@11:00	Aqueous	µg/L	4

Sample #	Tests	Status	QA Method
001	BTEX	Run	624
"	TVH(GRO)	Run	624 M
"	GRO	Cancel	8015B M
002	BTEX	Run	624
"	TVH(GRO)	Run	624 M
"	GRO	Cancel	8015B M
003	BTEX	Run	624
"	TVH(GRO)	Run	624 M
"	GRO	Cancel	8015B M
004	BTEX	Run	624
"	TVH(GRO)	Run	624 M
"	GRO	Cancel	8015B M

08/09/2004 15:56 by Ellen - NOTE 1

AS PER COC, EXPECT BTEX CONC. OF 280 ppb IN SAMPLE #1. EXPECT LOWER CONC. IN REMAINING SAMPLES. USE LOWEST MDLs POSSIBLE. MDLs FOR SAMPLES #2 - #4 SHOULD NO EXCEED MDLs OF SAMPLE #1.

08/09/2004 15:58 by Ellen - NOTE 2

AS PER COC, EXPECT GRO CONCENTRATION OF 10 ppm IN SAMPLE #1. EXPECT LOWER CONC. IN REMAINING SAMPLES. USE LOWEST MDL POSSIBLE. MDL FOR SAMPLES #2 - #4 SHOULD NO EXCEED MDL OF SAMPLE #1.

08/12/2004 16:11 by Ellen - REV 1

GRO TO BE RUN BY 624.

INTEGRATED ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIPT VERIFICATION

CASE NC **E04** **07595**

CLIENT: **Isatec**

COOLER TEMPERATURE: 2° - 6°C: ☒ (See Chain of Custody)

CHAIN OF CUSTODY: COMPLETE / INCOMPLETE Comments: _____

Sample Bottles Intact: ☒ Comments: _____
 Sample Labels Intact/ Correct: ☒ _____
 Sufficient Sample Volume: ☒ _____
 Correct bottles/ preservative: ☒ _____
 Samples received in holding time/ prep time: ☒ _____
 Headspace/ bubbles in voa samples: ☒ _____
 Samples to be subcontracted: ☒ _____

Preserved Sample pH checked: ☒
 (Excluding voa samples)

KEY
☒ = YES
☒ = NO
☒ = N/A

ADDITIONAL COMMENTS: _____

SAMPLE(S) VERIFIED BY: INITIAL ☒

DATE **8/8/21**

CORRECTIVE ACTION REQUIRED: YES ☐ (SEE BELOW)

NO ☒

CLIENT NOTIFIED: YES ☐ Date/ Time: _____ NO ☐

PROJECT CONTACT: _____

SUBCONTRACTED LAB: _____

DATE SHIPPED: _____

ADDITIONAL COMMENTS: _____

VERIFIED/TAKEN BY: INITIAL ☐

DATE ☐

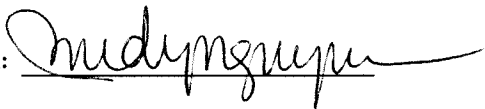
LABORATORY CUSTODY CHRONICLE

Case No. **E04-07595**

Client Isotec

Project TTFW/MOFFET FIELD CA - 800781

			Preparation		Analysis	
			Date / Time	Analyst	Date / Time	Analyst
Department: Volatiles						
BTEX	07595-001	Aqueous	n/a	n/a	8/11/04	Barbara
"	-002	Aqueous	n/a	n/a	8/11/04	Barbara
"	-003	Aqueous	n/a	n/a	8/11/04	Barbara
"	-004	Aqueous	n/a	n/a	8/11/04	Barbara
TVH(GRO)	07595-001	Aqueous	n/a	n/a	8/23/04	Barbara
"	-002	Aqueous	n/a	n/a	8/23/04	Barbara
"	-003	Aqueous	n/a	n/a	8/23/04	Barbara
"	-004	Aqueous	n/a	n/a	8/23/04	Barbara

Review and Approval: 



ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07488

MDL = METHOD DETECTION LIMIT

Metals

Lab ID: 07488-001

Client ID: 86-S14-005

Matrix-Units: Soil-mg/Kg

Percent Moisture: 17.8

Date Sampled: 8/4/2004

Time Sampled: NA

Date Analyzed: 8/10/04

Parameter	Result	Q	MDL
Iron	28500		30.4
Manganese	720		1.22

General Analytical

Lab ID: 07488-001

Client ID: 86-S14-005

Percent Moisture: 17.8

Date Sampled: 8/4/2004

Time Sampled: NA

Parameter	Result	MDL	Matrix-Units	Date Analyzed
Total Organic Carbons	13500	2190	Soil-mg/Kg	8/9/2004 9:00

Volatiles - BTEX

Lab ID: 07488-002

Client ID: SL/INITIAL

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 27.6

Date Sampled: 8/4/2004

Time Sampled: NA

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Benzene	0.716		0.691
Toluene	ND		0.691
Ethylbenzene	19.6		0.691
Total Xylenes	18.7		0.691

Hydrocarbons

Lab ID: 07488-002

Client ID: SL/INITIAL

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 27.6

Date Sampled: 8/4/2004

Time Sampled: NA

Date Analyzed: 8/12/04

Compound	Conc	Q	MDL
Total Volatile Hydrocarbons(GRO)	267		23.7

ND = Analyzed for but Not Detected at the MDL



ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07488

MDL = METHOD DETECTION LIMIT

Volatiles - BTEX

Lab ID: 07488-003

Client ID: 86-S14

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/4/2004

Time Sampled: NA

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Benzene	6130		48.0
Toluene	ND		41.0
Ethylbenzene	ND		38.0
Total Xylenes	ND		118

Hydrocarbons

Lab ID: 07488-003

Client ID: 86-S14

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/4/2004

Time Sampled: NA

Date Analyzed: 8/11/04

Compound	Conc	Q	MDL
Total Volatile Hydrocarbons(GRO)	17.8		10.0

Metals

Lab ID: 07488-004

Client ID: 86-S14 FILT.

Matrix-Units: Aqueous-µg/L

Percent Moisture: 100

Date Sampled: 8/6/2004


Time Sampled: NA

Date Analyzed: 8/12/04

Parameter	Result	Q	MDL
Iron	ND		100
Manganese	635		4.00

ND = Analyzed for but Not Detected at the MDL

These data have been reviewed and accepted by:


Michael H. Leftin, PhD
Laboratory Director

REPORTING & BILLING

Conditional / TPHC				Results needed by:	Report Format
24 hr*	48 hr	72 hr	1 wk		Results Only
Verbal/Fax					Reduced
24 hr*	48 hr*	72 hr*	1 wk* 2 wk/Std		Regulatory
Hard Copy					SRP Disk**; dbf or wk1
72 hr*	1 wk*	2 wk*	3 wk/Std		Special Requirements:

* Prior to sample arrival, Lab notification is required. RUSH Surcharge will apply

***Prior to sample arrival, Lab notification is required. RUSH Surcharge will apply**

ANALYTICAL PARAMETERS / PRESERVATIVES

**** Circle format required**





[illegible]

SAMPLE MATRIX	
W - Waste	SL - Sludge A - Aqueous
O - Oil	X - Other S - Soil
GW - Groundwater	SOL - Solid

[illegible]

Please print legibly and fill out completely. Samples cannot be processed and the turnaround time will not start until any ambiguities have been resolved.

CUSTODY LOG

Signature/Company	Date	Time	Signature/Company
Relinquished by: 	8-5-04	12:20	Received by: 
Relinquished by: 	8-5-04	1750	Received by: 
Relinquished by:			Received by:
Relinquished by:			Received by:
Relinquished by:			Received by:

LAB COPIES - WHITE & YELLOW; CLIENT COPY - PINK

Comments: Expect 13,000 ppm (TPH-GRO) & 46 ppm (BTEX
in sl sample, & 10 ppm (TPH-GRO) & 280 ppb (BTEX)

Lab Case # _____

Describe

PAGE:

REV 10/03

PROJECT INFORMATION



Case No. **E04-07488**

Project **TTFW/MOFFET FIELD CA - 800781**

Customer Isotec	P.O. # 2635
Contact Prasad Kakarla	Received 8/5/2004 17:50
E-Mail pkakarla@insituoxidation.com <input checked="" type="checkbox"/> EMail EDDs	Verbal Due 8/20/2004
Phone (609) 275-8500 Fax 1(609) 275-9608	Report Due 8/27/2004
Report To	Bill To
51 Everett Drive	51 Everett Drive
Suite A-10	Suite A-10
West Windsor, NJ 08550	West Windsor, NJ 08550
Attn: Prasad Kakarla	Attn: Prasad Kakarla
Report Format Standard	
Additional Info <input type="checkbox"/> State Form <input type="checkbox"/> Field Sampling <input type="checkbox"/> Conditional VOA	

Lab ID	Client Sample ID	Depth Top / Bottom	Sampling Time	Matrix	Unit	# of Containers
07488-001	86-S14-005	n/a	8/4/2004	Soil	mg/Kg	2
07488-002	SL/INITIAL	n/a	8/4/2004	Sludge	mg/Kg	2
07488-003	86-S14	n/a	8/4/2004	Aqueous	µg/L	4
07488-004	86-S14 FILT.	n/a	8/6/2004	Aqueous	µg/L	1

Sample #	Tests	Status	QA Method
001	Iron - Fe	Run	6020
"	Manganese - Mn	Run	6020
"	TOC	Run	Modified Lloyd Kahn
002	BTEX	Run	8260B
"	GRO	Run	8015B M
003	BTEX	Run	624
"	GRO	Run	8015B M
"	Sample Filtration	Run	
004	Iron - Fe	Run	6020
"	Manganese - Mn	Run	6020

08/06/2004 12:52 by Ellen - NOTE 1

PORION OF SAMPLE #3 TO BE FILTERED TO CREATE SAMPLE #4.

08/06/2004 12:53 by Ellen - NOTE 2

AS PER COC, EXPECT 46 ppm OF BTEX IN SAMPLE #2.

08/06/2004 12:54 by Ellen - NOTE 3

AS PER COC, EXPECT 280 ppb OF BTEX IN SAMPLE #3.

PROJECT INFORMATION



Case No. **E04-07488**

Project **TTFW/MOFFET FIELD CA - 800781**

08/06/2004 12:55 by Ellen - NOTE 4

AS PER COC, EXPECT 13000 ppm GRO IN SAMPLE #2 & 10 ppm GRO IN SAMPLE #3.

INTEGRATED ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIPT VERIFICATION

CASE NC **E04**

07488

CLIENT:

Isotec

COOLER TEMPERATURE: 2° - 6°C: ☒ (See Chain of Custody)

CHAIN OF CUSTODY:

COMPLETE / INCOMPLETE

Comments:

Sample Bottles Intact:

☒

Comments:

Sample Labels Intact/ Correct:

☒

Sufficient Sample Volume:

☒

Correct bottles/ preservative:

☒

Samples received in

holding time/ prep time:

☒

Headspace/ bubbles in voa samples:

☒

Samples to be subcontracted:

Preserved Sample pH checked:

(Excluding voa samples)

☒

KEY

☒ = YES

☒ = NO

☒ = N/A

ADDITIONAL COMMENTS: *Sample date?*

SAMPLE(S) VERIFIED BY: INITIAL *fr*

DATE *8/5/04*

CORRECTIVE ACTION REQUIRED:

YES

(SEE BELOW)

NO

CLIENT NOTIFIED:

YES

☒

Date/ Time:

left message 8/6 1230

8/6 1400

NO

PROJECT CONTACT:

Prasad / Yin

SUBCONTRACTED LAB:

DATE SHIPPED:

ADDITIONAL COMMENTS:

Sample date = 8/5/04

VERIFIED/TAKEN BY:

INITIAL

ES

DATE

8/6/04

LABORATORY CUSTODY CHRONICLE

Case No. **E04-07488**

Client Isotec

Project TTFW/MOFFET FIELD CA - 800781

			Preparation		Analysis	
			Date / Time	Analyst	Date / Time	Analyst
Department: Volatiles						
BTEX	07488-002	Sludge	n/a	n/a	8/11/04	Xing
"	-003	Aqueous	n/a	n/a	8/11/04	Barbara
TVH(GRO)	-003	Aqueous	n/a	n/a	8/11/04	Barbara
Department: GC						
GRO	07488-002	Sludge	8/9/04	Archimede	8/12/04	Margaret
Department: Metals						
Iron - Fe	07488-001	Soil	8/9/04	Lisa	8/10/04	Helge
"	-004	Aqueous	8/11/04	Lisa	8/12/04	Helge
Manganese - Mn	07488-001	Soil	8/9/04	Lisa	8/10/04	Helge
"	-004	Aqueous	8/11/04	Lisa	8/12/04	Helge
Metals Filtration	-003	Aqueous	n/a	n/a	8/11/04	Lisa
Department: Wet Chemistry						
TOC	07488-001	Soil	n/a	n/a	8/9/04	Elma

Review and Approval:





ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07633

MDL = METHOD DETECTION LIMIT

Volatiles - BTEX

Lab ID: 07633-003

Client ID: SL/T-B

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 44.5

Date Sampled: 8/10/04

Time Sampled: 09:00

Date Analyzed: 8/17/04

Compound	Conc	Q	MDL
Benzene	ND		0.090
Toluene	ND		0.180
Ethylbenzene	6.62		0.180
Total Xylenes	6.50		0.180

Hydrocarbons

Lab ID: 07633-003

Client ID: SL/T-B

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 44.5

Date Sampled: 8/10/04

Time Sampled: 09:00

Date Analyzed: 8/13/04

Compound	Conc	Q	MDL
GRO	74.3		32.0

Volatiles - BTEX

Lab ID: 07633-004

Client ID: SL/T-C

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 49.1

Date Sampled: 8/10/04

Time Sampled: 09:00

Date Analyzed: 8/17/04

Compound	Conc	Q	MDL
Benzene	ND		0.098
Toluene	ND		0.196
Ethylbenzene	1.56		0.196
Total Xylenes	1.42		0.196

Hydrocarbons

Lab ID: 07633-004

Client ID: SL/T-C

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 49.1

Date Sampled: 8/10/04

Time Sampled: 09:00

Date Analyzed: 8/13/04

Compound	Conc	Q	MDL
GRO	82.4		32.8

ND = Analyzed for but Not Detected at the MDL



ANALYTICAL DATA REPORT

for

Isotec

51 Everett Drive

Suite A-10

West Windsor, NJ 08550

Project Name: TTFW/MOFFET FIELD CA - 800781

Lab Case Number: E04-07633

MDL = METHOD DETECTION LIMIT

Volatiles - BTEX

Lab ID: 07633-005

Client ID: SL/T-D

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 40.9

Date Sampled: 8/10/04

Time Sampled: 09:00

Date Analyzed: 8/17/04

Compound	Conc	Q	MDL
Benzene	ND		0.085
Toluene	ND		0.169
Ethylbenzene	1.03		0.169
Total Xylenes	1.08		0.169

Hydrocarbons

Lab ID: 07633-005

Client ID: SL/T-D

Matrix-Units: Sludge-mg/Kg

Percent Moisture: 40.9

Date Sampled: 8/10/04

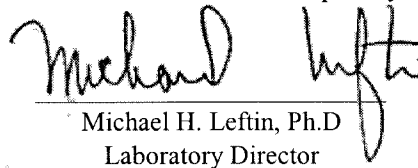
Time Sampled: 09:00

Date Analyzed: 8/13/04

Compound	Conc	Q	MDL
GRO	142		30.8

ND = Analyzed for but Not Detected at the MDL

These data have been reviewed and accepted by:


Michael H. Leftin, Ph.D
Laboratory Director

CLIENT & PROJECT

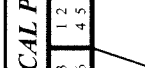
Company	ISOTEC	Fax to:	Prasad Kakarla
		Fax #:	
Address:	51 Everett Dr. Suite A-10	EN Mail to:	
	West Windsor, NJ 08550	Report to:	Same
		Address:	
Telephone #:	609-275-8500		
Fax #:	609-275-9608	Invoice to:	same
Project Name:	TEFW/Moffet Field, CA	Address:	
Project Manager:	Prasad Kakarla		
Reference ID#:	800781		

REPORTING & BILLING

<u>Conditional / TPHC</u>			
24 hr*	48 hr	72 hr	
<u>Verbal/Fax</u>			
24 hr*	48 hr*	72 hr*	
<u>Hard Copy</u>			
72 hr*	1 wk*	2 wk*	
*Prior to sample arrival			

ANALYTICAL PAGE

1 2 3	1 2 3	1 2 3
4 5 6	4 5 6	4 5 6



***Prior to sample arrival, Lab notification is required. RUSH Surchage will apply**

ANALYTICAL PARAMETERS / PRESERVATIVES

**** Circle format required**

						Preservatives					
TPH - GRO TEX only						1. HCL					
						3. HNO ₃					
						2. NaOH					
						4. H ₂ SO ₄					
						5. MeOH					
						6. Other					
						COOLER TEMP.					
						4 °C					
Comments/Area of Concern											




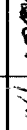


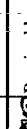



SAMPLE INFORMATION

SAMPLE MATRIX	
W - Waste	SL - Sludge A - Aqueous
O - Oil	X - Other S - Soil
GW - Groundwater	SOL - Solid

[illegible]

Please print legibly and fill out completely. Samples cannot be processed and the turnaround time will not start until any ambiguities have been resolved.

CUSTODY LOG

Signature/Company	Date	Time	Signature/Company
Relinquished by: 	8-10-04	1200	Received by: 
Relinquished by: 	8-10-04	1650	Received by: 
Relinquished by: 			Received by: 
Relinquished by: 			Received by: 
Relinquished by: 			Received by: 

LAB COPIES - WHITE & YELLOW; CLIENT COPY - PINK

REV 10/03

PROJECT INFORMATION



E 0 4 - 0 7 6 3 3

Case No. **E04-07633**

Project **TTFW/MOFFET FIELD CA - 800781**

Customer Isotec	P.O. # 2637
Contact Prasad Kakarla	Received 8/10/2004 16:50
E-Mail pkakarla@insituoxidation.com <input checked="" type="checkbox"/> EMail EDDs	Verbal Due 8/24/2004
Phone (609) 275-8500 Fax 1(609) 275-9608	Report Due 8/31/2004
Report To	Bill To
51 Everett Drive	51 Everett Drive
Suite A-10	Suite A-10
West Windsor, NJ 08550	West Windsor, NJ 08550
Attn: Prasad Kakarla	Attn: Prasad Kakarla
Report Format Standard	
Additional Info <input type="checkbox"/> State Form <input type="checkbox"/> Field Sampling <input type="checkbox"/> Conditional VOA	

Lab ID	Client Sample ID	Depth Top / Bottom	Sampling Time	Matrix	Unit	# of Containers
07633-001	SL/CONTROL	n/a	8/10/2004@09:00	Sludge	mg/Kg	2
07633-002	SL/T-A	n/a	8/10/2004@09:00	Sludge	mg/Kg	2
07633-003	SL/T-B	n/a	8/10/2004@09:00	Sludge	mg/Kg	2
07633-004	SL/T-C	n/a	8/10/2004@09:00	Sludge	mg/Kg	2
07633-005	SL/T-D	n/a	8/10/2004@09:00	Sludge	mg/Kg	2

Sample #	Tests	Status	QA Method
001	BTEX	Run	8260B
"	GRO	Run	8015B M
002	BTEX	Run	8260B
"	GRO	Run	8015B M
003	BTEX	Run	8260B
"	GRO	Run	8015B M
004	BTEX	Run	8260B
"	GRO	Run	8015B M
005	BTEX	Run	8260B
"	GRO	Run	8015B M

08/11/2004 09:37 by Ellen - NOTE 1

AS PER COC, EXPECT BTEX CONC. OF 46 ppm IN SAMPLE #1. EXPECT LOWER CONCENTRATIONS IN REMAINING SAMPLES. PLEASE USE LOWEST MDL POSSIBLE. MDLs FOR SAMPLES #2 - #5 SHOULD NOT EXCEED MDLs OF SAMPLE #1.

08/11/2004 09:38 by Ellen - NOTE 2

AS PER COC, EXPECT GRO CONC. OF 13000 ppm IN SAMPLE #1. EXPECT LOWER CONCENTRATIONS IN REMAINING SAMPLES. PLEASE USE LOWEST MDL POSSIBLE. MDLs FOR SAMPLES #2 - #5 SHOULD NOT EXCEED MDLs OF SAMPLE #1.

INTEGRATED ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIPT VERIFICATION

CASE NC **E04** **07633**

CLIENT: **ISS TEC**

COOLER TEMPERATURE: 2° - 6°C: ☒ (See Chain of Custody)

CHAIN OF CUSTODY: COMPLETE / INCOMPLETE Comments: _____

Sample Bottles Intact: ☒ Comments: _____
 Sample Labels Intact/ Correct: ☒ _____
 Sufficient Sample Volume: ☒ _____
 Correct bottles/ preservative: ☒ _____
 Samples received in _____
 holding time/ prep time: ☒ _____
 Headspace/ bubbles in voa samples: ☒ _____
 Samples to be subcontracted: ☒ _____

Preserved Sample pH checked: ☒
 (Excluding voa samples)

KEY
☒ = YES
☒ = NO
☒ = N/A

ADDITIONAL COMMENTS: _____

SAMPLE(S) VERIFIED BY: INITIAL **E3**

DATE **8/10/07**

CORRECTIVE ACTION REQUIRED: YES ☐ (SEE BELOW)

NO ☒

CLIENT NOTIFIED: YES ☐ Date/ Time: _____ NO ☐

PROJECT CONTACT: _____

SUBCONTRACTED LAB: _____

DATE SHIPPED: _____

ADDITIONAL COMMENTS: _____

VERIFIED/TAKEN BY: INITIAL ☐

DATE ☐

LABORATORY CUSTODY CHRONICLE

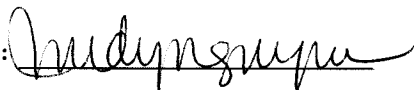
Case No. **E04-07633**

Client Isotec

Project TTFW/MOFFET FIELD CA - 800781

			Preparation		Analysis	
			Date / Time	Analyst	Date / Time	Analyst
Department: Volatiles						
BTEX	07633-001	Sludge	n/a	n/a	8/17/04	Xing
"	-002	Sludge	n/a	n/a	8/17/04	Xing
"	-003	Sludge	n/a	n/a	8/17/04	Xing
"	-004	Sludge	n/a	n/a	8/17/04	Xing
"	-005	Sludge	n/a	n/a	8/17/04	Xing
Department: GC						
GRO	07633-001	Sludge	8/12/04	Archimede	8/13/04	Margaret
"	-002	Sludge	8/12/04	Archimede	8/13/04	Margaret
"	-003	Sludge	8/12/04	Archimede	8/13/04	Margaret
"	-004	Sludge	8/12/04	Archimede	8/13/04	Margaret
"	-005	Sludge	8/12/04	Archimede	8/13/04	Margaret

Review and Approval:



APPENDIX C

SURVEY REPORT OF INJECTION POINTS

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COAST SURVEYING, INC.

15031 PARKWAY LOOP, SUITE B, TUSTIN, CA 92780-6527 • (714) 918-6266 • FAX (714) 918-6277

MOFFETT FEDERAL AIRFIELD SAMPLING LOCATIONS

Date Surveyed: May 18, 2005

IP Locations

IP1	1974078.54	6111270.45	33.03
IP2	1974075.35	6111281.45	33.03
IP3	1974070.50	6111295.01	32.77
IP4	1974025.47	6111283.78	33.02
IP5	1974029.61	6111270.15	33.06
IP6	1974033.69	6111255.42	33.10
IP7	1974081.60	6111290.59	32.95
IP8	1974085.01	6111301.91	32.85
IP9	1974068.81	6111339.87	32.51
IP10	1974077.43	6111333.21	32.40
IP11	1974015.60	6111326.64	33.15
IP12	1974065.62	6111264.15	32.82
IP13	1974055.46	6111292.50	32.87
IP14	1974030.55	6111333.07	32.95
IP15	1974067.04	6111311.87	32.64
IP16	1974050.16	6111261.09	32.96
IP17	1974071.52	6111349.01	32.58
IP18	1974038.11	6111326.43	32.60
IP19	1974059.63	6111277.50	32.80
IP20	1974082.53	6111311.74	32.72
IP21	1974040.27	6111296.94	32.87
IP22	1974059.04	6111343.79	32.72
IP23	1974018.51	6111297.51	32.82
IP24	1974046.83	6111273.98	32.90
IP25	1974044.41	6111338.62	32.84
IP26	1974068.37	6111327.87	32.48
IP27	1974054.27	6111334.04	32.59
IP28	1974054.04	6111301.05	32.79
IP29	1974031.23	6111298.47	32.95
IP30	1974043.08	6111290.32	32.90

Coordinates are CCS NAD 83, Zone 3, U.S. Survey Feet.

Elevations are NAVD 88, U.S. Survey Feet.

Positions were determined using NASA Ames Research Center Control Monument ARC-30, a disc set flush in concrete on Northeast corner of raised concrete distribution system, 60' West of Building 250B.

Coordinates and elevations provided by Tetra Tech FW, Inc. for "NASA ARC-30" are:

Northing	Easting	Elevation
1979189.19	6108650.33	13.44

Prepared by me or under my direct supervision
this 26th day of May, 2005.

Original Signed by Ruel del Castillo
RUEL DEL CASTILLO, PLS 4212
REGISTRATION EXPIRES 6/30/06



APPENDIX D

GROUNDWATER SAMPLING DATA SHEETS
(PROVIDED ON CD ONLY)

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TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1/10/05 CS 6606Well Name ERM-3Project Site 14 BaselineProject No. 1990.086EWell Location MoffettSample Date 1/10/05Sampling Personnel D. HarrisonB. OgleSample ID 88-S14-037Duplicate ID N/AScreen Interval 16-21Station Elevation GND TOCImmiscible Phases Present ☐ Yes ☒ NoStatic Water Level (from TOC) / Time 4.50/0902 4.50/0903 4.50/0904Average Water Level (from TOC) 4.50Reference Point TOC PID Readings (background) OpenReference Elevation PID Reading (TOC) Open

Static Elevation Notes

Well Depth MEAS 20.71 RPTD Feet of WaterDepth of Bottom of Tubing 18.5Depth to Water (w/ Tubing in Well) 4.50

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EN/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1123	.4	0.33	7.4	116	22.7	503.5	2.4	.1			4.51	
1124	.4	0.23	7.3	98	22.6	532.9	2.0	.3			4.52	
1129	.4	0.17	7.3	90	21.9	567	1.2	.5			4.53	
1132	.4	0.16	7.3	87	21.5	698.1	0.0	.7			4.53	
1135	.4	0.15	7.3	85	21.0	732	0.0	.9			4.53	
1138	.4	0.14	7.3	80	20.8	745.7	0.0	1.1			4.53	
1140	Collect	Sample										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs-mtbe&btex	TPH-p											
----------------	-------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

.1	.1											
----	----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: GoodRemarks: Slight H₂S odor.

FIELD EQUIPMENT

pH Meter HydrolabTemperature Meter HydrolabTurbidity Meter LaMotteSpec. Elec. Cond. Meter HydrolabORP Meter HydrolabD.O. Meter HydrolabInterface Probe SolinstPID/OVA Mini-Rae 2000Pump Geo-pumpFilter Apparatus N/ASerial Number R40782Serial Number R40782Serial Number 02013Serial Number R40782Serial Number R40782Serial Number R40782Serial Number #25582Serial Number 00320Serial Number #BA0041Number of Bottles 6X 40mL VField Notebook Pgs. 20 + 21Sample Method Low Flow-GrabDischarge Water Containerized ☒ Yes ☐ No



TETRATECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1/10/05 6:16 CSWell Name ERM-2Project Site 14 BaselineProject No. 1990.086EWell Location MoffettSample Date 1/10/05Sampling Personnel D. HarrisonB. OgleSample ID 86-S14-035Duplicate ID 86-S14-036Screen Interval 14-19Station Elevation GND TOC Immiscible Phases Present ☐ Yes ☒ NoStatic Water Level (from TOC) / Time 4.16 - 0858 4.16 - 0859 4.16 - 0900Average Water Level (from TOC) 4.16Reference Point TOC PID Readings (background) OppmReference Elevation Oppm PID Reading (TOC) OppmStatic Elevation Total Depth is Incorrect.Well Depth MEAS 15.74 RPTD Feet of WaterDepth of Bottom of Tubing 16.5 15 DRDepth to Water (w/ Tubing in Well) 4.16

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1013	.4	0.46	7.5	216	16.4	2155	1.7	.1			4.19	
1016	.4	0.27	7.4	172	17.3	2140	12.2	.3			4.22	
1019	.4	0.21	7.4	156	18.1	2107	5.8	.5			4.24	
1022	.4	0.17	7.3	155	18.6	2116	4.3	.7			4.25	
1025	.4	0.16	7.3	154	18.9	2124	2.6	.9			4.26	
1028	.4	0.15	7.3	156	20.3	2103	2.0	1.1			4.28	
1030	Collect	Sample										
1040	Collect	Field Duplicate										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs-mtbe&btex	TPH-p											
----------------	-------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

.1	.1											
----	----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - bolts brokenRemarks: Clear/odorless - T.D. is 3' less than expected.

FIELD EQUIPMENT

pH Meter HydrolabTemperature Meter HydrolabTurbidity Meter LaMotteSpec. Elec. Cond. Meter HydrolabORP Meter HydrolabD.O. Meter HydrolabInterface Probe SolinstPID/OVA Mini-Rae 2000Pump Geo-pumpFilter Apparatus N/ASerial Number R40782Serial Number R40782Serial Number 02013Serial Number R40782Serial Number R40782Serial Number R40782Serial Number #25582Serial Number 00320Serial Number #BA0041Number of Bottles 12X 40mL VField Notebook Pg. 20Sample Method Low Flow-GrabDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1/10/04 05 CS 6-6-06

Well Name W14-2
 Project Site 14 Baseline
 Project No. 1990.086E
 Well Location Moffett
 Sample Date 1/10/05
 Sampling Personnel D. Harrison
B. Ogle

Screen Interval 15-25
 Station Elevation GND TOC Immiscible Phases Present ☐ Yes ☒ No
 Static Water Level (from TOC) / Time 3.90 - 0908 3.90 - 0909 3.90 - 0910
 Average Water Level (from TOC) 3.90
 Reference Point TOC PID Readings (background) Open
 Reference Elevation PID Reading (TOC) Open
 Static Elevation Notes
 Well Depth MEAS 24.00 RPTD Feet of Water
 Depth of Bottom of Tubing 20
 Depth to Water (w/ Tubing in Well) 3.90

Sample ID 86-S14-038
 Duplicate ID N/A

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EWORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1315	.4	0.20	7.5	54	28.1	643.1	1.1	.1			3.92	
1318	.4	0.14	7.5	46	27.8	671.5	0.9	.3			3.94	
1321	.4	0.09	7.4	39	27.3	682	0.7	.5			3.97	
1324	.4	0.09	7.4	38	26.5	721.3	1.3	.7			3.98	
1328	.4	0.08	7.4	37	26.1	740.5	0.2	.9			3.99	
1331	.4	0.08	7.4	38	26.3	768.7	0.8	1.1			4.01	
1335	Collect Sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs-mtbe&btex	TPH-p											
----------------	-------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

.1 L/min	.1 L/min											
----------	----------	--	--	--	--	--	--	--	--	--	--	--

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - TOC is ~ 2' by bgs.Remarks: Strong H₂S odor. Samples effervesced slightly.

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter Hydrolab
 Turbidity Meter LaMotte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter Hydrolab
 D.O. Meter Hydrolab
 Interface Probe Solinst
 PID/OVA Mini-Rae 2000
 Pump Geo-pump
 Filter Apparatus N/A

Serial Number R40782
 Serial Number R40782
 Serial Number 02013
 Serial Number R40782
 Serial Number R40782
 Serial Number R40782
 Serial Number #25582
 Serial Number 00320
 Serial Number #BA0041

Number of Bottles 6X 40ml VField Notebook pg. 21Sample Method Low Flow-GrabDischarge Water Containerized ☒ Yes ☐ No



Page 1 of 1

Date 1/10/04 05 66.06

Well Name <u>W14-3</u>	Screen Interval <u>15-30</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>Site 14 Baseline</u>	Static Water Level (from TOC) / Time <u>4.64 - 0912</u> <u>4.64 - 0913</u> <u>4.64 - 0914</u>	Average Water Level (from TOC) <u>4.64</u>	
Project No. <u>1990.086E</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>Appn</u>	
Well Location <u>Moffett</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>Appn</u>	
Sample Date <u>1/16/05</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sampling Personnel <u>D. Harrison</u>	Well Depth MEAS <u>30.15</u> RPTD <u> </u>	Feet of Water <u> </u>	
<u>B. Ogle</u>	Depth of Bottom of Tubing <u>22.5</u>		
	Depth to Water (w/ Tubing in Well) <u>4.63</u>		
Sample ID <u>86-S14-039</u>			
Duplicate ID <u>Collect MS/MSD</u>			

[illegible]

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be ≤ 0.33 foot

VOCs-mtbe&btex	TPH-p						
----------------	-------	--	--	--	--	--	--

1	L/m	1	L/m								
---	-----	---	-----	--	--	--	--	--	--	--	--

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Remarks: Reduced flowrate @ 1425 to lessen drawdown

pH Meter Hydrolab
 Temperature Meter Hydrolab
 Turbidity Meter LaMotte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter Hydrolab
 D.O. Meter Hydrolab
 Interface Probe Solinst
 PID/OVA Mini-Rae 2000
 Pump Geo-pump
 Filter Apparatus N/A

Serial Number	R40782
Serial Number	R40782
Serial Number	02013
Serial Number	R40782
Serial Number	R40782
Serial Number	R40782
Serial Number	#25582
Serial Number	00320
Serial Number	#BA0041

Field Notebook Pg. 22

Sample Method Low Flow-Grab

Discharge Water Containerized ☒ Yes ☐ No

LOW-FLOW GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 1/10/05 6-6-06

Well Name <u>W14-10</u>	Screen Interval <u>13-20</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>Site 14 Baseline</u>	Static Water Level (from TOC) / Time <u>4.15-0916 4.15-0917 4.15-0918</u>		
Project No. <u>1990.086E</u>	Average Water Level (from TOC) <u>4.15</u>		
Well Location <u>Moffett</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>Open</u>	
Sample Date <u>1/11/03</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>Open</u>	
Sampling Personnel <u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>	
<u>B. Ogle</u>	Well Depth MEAS <u>19.24</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sample ID <u>86-S14-040</u>	Depth of Bottom of Tubing <u>16.5</u>		
Duplicate ID <u>N/A</u>	Depth to Water (w/ Tubing in Well) <u>4.15</u>		

PURGING

[illegible]

Notes:

1. Purge rate = $0.2 \cdot 0.5$ L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

SAMPLE PARAMETERS						
VOCs-mtbe&blex	TPH-p					

SAMPLE RATE

SAMPLE RATE						
1	1					

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: Odor pss / Color pss

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter Hydrolab
 Turbidity Meter LaMotte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter Hydrolab
 D.O. Meter Hydrolab
 Interface Probe SolInst
 PID/OVA Mini-Rae 2000
 Pump Geo-pump
 Filter Apparatus N/A

Serial Number R40782
Serial Number R40782
Serial Number 02013
Serial Number R40782
Serial Number R40782
Serial Number R40782
Serial Number #25582
Serial Number 00320
Serial Number #BA0041

Number of Bottles 6 X 40mL V

Field Notebook pg. 23

Sample Method **Low Flow-Grab**

Discharge Water Containerized ☒ Yes ☐ No



Page 1 of 1

Date 1/10/04 05 66-06

Well Name <u>W14-11</u>	Screen Interval <u>8-20</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u> Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>Site 14 Baseline</u>	Static Water Level (from TOC) / Time <u>4.50 - 0921</u> <u>4.50 - 0922</u> <u>4.50 - 0923</u>	
Project No. <u>1990.086E</u>	Average Water Level (from TOC) <u>4.50</u>	
Well Location <u>Moffett</u>	Reference Point <u>TOL</u>	PID Readings (background) <u>Off</u>
Sample Date <u>11/1/05</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>Off</u>
Sampling Personnel <u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>
<u>B. Ogle</u>	Well Depth MEAS <u> </u> RPTD <u> </u>	Feet of Water <u> </u>
Sample ID <u>88-S14-041</u>	Depth of Bottom of Tubing <u>14</u>	
Duplicate ID <u>N/A</u>	Depth to Water (w/ Tubing in Well) <u>4.50</u>	

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs-mtbe&ptex	TPH-p						
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SAMPLE RATE

6/4/21	6/4/21						
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Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well:

Remarks: Clear / H₂S odor.

FIELD EQUIPMENT

pH Meter Hydrolab Serial Number R40782 Number of Bottles 6 X 40mL V
 Temperature Meter Hydrolab Serial Number R40782
 Turbidity Meter LaMotte Serial Number 02013
 Spec. Elec. Cond. Meter Hydrolab Serial Number R40782 Field Notebook Pgs. 23 + 24
 ORP Meter Hydrolab Serial Number R40782
 D.O. Meter Hydrolab Serial Number R40782 Sample Method Low Flow-Grab
 Interface Probe Solinst Serial Number #25582
 PID/OVA Mini-Rae 2000 Serial Number 00320
 Pump Geo-pump Serial Number #BA0041
 Filter Apparatus N/A Discharge Water Containerized ☒ Yes ☐ No

Discharge Water Containerized	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
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Page 1 of 1

Date 1/10/04 05

6-6-56

Well Name <u>W14-12</u>	Screen Interval <u>15-20</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>Site 14 Baseline</u>	Static Water Level (from TOC) / Time <u>4.53 - 0924</u> <u>4.52 - 0925</u> <u>4.52 - 0926</u>	Average Water Level (from TOC) <u>4.52</u>	
Project No. <u>1990.086E</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0 ppm</u>	
Well Location <u>Moffett</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0 ppm</u>	
Sample Date <u>1/11/05</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sampling Personnel <u>D. Harrison</u>	Well Depth MEAS <u>19.20</u> RPTD <u> </u>	Feet of Water <u> </u>	
<u>B. Ogle</u>	Depth of Bottom of Tubing <u>17.5</u>		
Sample ID <u>86-S14-042</u>	Depth to Water (w/ Tubing in Well) <u>4.52</u>		
Duplicate ID <u>N/A</u>			

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs-mibx&btex	TPH-p					
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SAMPLE RATE

1		9							
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Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: Slight brown / odorless

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter Hydrolab
 Turbidity Meter LaMotte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter Hydrolab
 D.O. Meter Hydrolab
 Interface Probe Solinst
 PID/OVA Mini-Rae 2000
 Pump Geo-pump
 Filter Apparatus N/A

Serial Number	R40782
Serial Number	R40782
Serial Number	02013
Serial Number	R40782
Serial Number	R40782
Serial Number	R40782
Serial Number	#25582
Serial Number	00320
Serial Number	#BA0041

Number of Bottles 6 X 40mL V

Field Notebook Pg. 24

Sample Method Low Flow-Grab

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH

1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

CHAIN-OF-CUSTODY RECORD

NUMBER 10313

PROJECT NAME UST Site 14 Baseline		PURCHASE ORDER NO. 20848-Task 33		ANALYSES REQUIRED										LABORATORY NAME EMAX		Project Information Section Do not submit to Laboratory		
PROJECT LOCATION Moffett		PROJECT NO. 1990.086E												LABORATORY ID (FOR LABORATORY)				
SAMPLER NAME D. Harrison		AIRBILL NUMBER 845407660785												COMMENTS		LOCATION		
PROJECT CONTACT Lynn Jefferson		PROJECT CONTACT PHONE NUMBER 949/156-7500														DEPTH START END		
SAMPLE ID		DATE COLLECTED		TIME COLLECTED		NO. OF CONTAINER		LEVEL 3 4		T Y P E		T A T				QC		
86-S14-033		1/10/05		1000		6		X		W		10 day		X		TB		
86-S14-035		1/10/05		1030		6		X		W		10 day		X		Reg		
86-S14-036		1/10/05		1040		6		X		W		10 day		X		FD		
86-S14-037		1/10/05		1140		6		X		W		10 day		X		Reg		
86-S14-038		1/10/05		1335		6		X		W		10 day		X		Reg		
86-S14-039		1/12/05		1430		18		X		W		10 day		X		Reg		
86-S14-040		1/11/05		0955		6		X		W		10 day		X		Reg		
86-S14-041		1/11/05		1045		6		X		W		10 day		X		Reg		
86-S14-042		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-043		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-044		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-045		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-046		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-047		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-048		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-049		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-050		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-051		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-052		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-053		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-054		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-055		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-056		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-057		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-058		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-059		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-060		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-061		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-062		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-063		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-064		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-065		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-066		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-067		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-068		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-069		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-070		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-071		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-072		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-073		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-074		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-075		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-076		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-077		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-078		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-079		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-080		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-081		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-082		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-083		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-084		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-085		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-086		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-087		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-088		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-089		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-090		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-091		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-092		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-093		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-094		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-095		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-096		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-097		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-098		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-099		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-100		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-101		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-102		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-103		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-104		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-105		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-106		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-107		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-108		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-109		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-110		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-111		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-112		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-113		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-114		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-115		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-116		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-117		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-118		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-119		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-120		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-121		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-122		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-123		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-124		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-125		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-126		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-127		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-128		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-129		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-130		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-131		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-132		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-133		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-134		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-135		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-136		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-137		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-138		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-139		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-140		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-141		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-142		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-143		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-144		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-145		1/11/05		1130		6		X		W		10 day		X		Reg		
86-S14-146		1/11/05		1130		6		X										



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 4-20-05

Well Name <u>ERM-2</u>	Screen Interval <u>14-19</u>	Station Elevation <u>-</u> GND <u>-</u> TOC <u>-</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.07</u> <u>5.07</u>	5.07	
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>5.07 @ 1420</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-21-05</u>	Reference Elevation <u>-</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartoloma</u> <u>P. Graziani</u>	Static Elevation <u>-</u>	Notes	
Sample ID <u>86-514-045</u>	Well Depth MEAS <u>15.96</u> RPTD <u>-</u>	Feet of Water <u>-</u>	
Duplicate ID	Depth of Bottom of Tubing <u>16.5</u>		
	Depth to Water (w/ Tubing in Well) <u>5.15</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0952	0.2	0.53	7.55	-44	19.65	2105	60.0	0.25	-	-	5.21	-
0955	0.2	0.46	7.48	-50	19.76	2108	55.0	0.50	-	-	5.22	-
0958	0.2	0.31	7.43	-49	19.54	2159	45.0	0.75	-	-	5.22	-
1001	0.2	0.29	7.38	-49	19.70	2190	23.0	1.0	-	-	5.22	-
1004	0.2	0.26	7.37	-49	19.66	2201	21.0	1.25	-	-	5.23	-
1005	collect											
1007	0.2	0.28	7.36	-48	19.52	2206	9.8	1.50	-	-	5.23	-
1010	collect	Sample										

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
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Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Silt in Well Bottom

Remarks:

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter ↓
 Turbidity Meter LaMotte 2020
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter ↓
 D.O. Meter ↓
 Interface Probe Solinst
 PID/OVA MiniRAE 3000
 Pump Geopump
 Filter Apparatus N/A

Serial Number R41906
 Serial Number ↓
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number ↓
 Serial Number 27582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 6x40mL
 Field Notebook Site 14 South
 Sample Method LOW FLOW
 Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page ____ of ____

Date 4-20-05

Well Name <u>ERM-3</u>	Screen Interval <u>16-21</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.47</u> <u>5.47</u> <u>5.47</u>		
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>5.47</u> <u>01424</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-21-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziani</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
Sample ID <u>86-S14-046</u>	Well Depth MEAS <u>20.80</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Duplicate ID <u>86-S14-047</u>	Depth of Bottom of Tubing <u>18.0</u>		
	Depth to Water (w/ Tubing in Well) <u>5.50</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0814	0.2	0.80	7.25	-27	18.70	2088	3.2	0.25	—	—	5.59	—
0817	0.2	0.31	7.32	-39	18.90	2103	2.1	0.50	—	—	5.59	—
0820	0.2	0.18	7.32	-50	19.27	2158	6.0	0.75	—	—	5.59	—
0823	0.2	0.16	7.22	-53	19.40	2175	8.2	1.0	—	—	5.59	—
0826	0.2	0.16	7.31	-54	19.44	2190	3.5	1.25	—	—	5.59	—
0830	Collect	Sample										
0835	Collect	Duplicate										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Collect Duplicate

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter LaMotte 2020
 Turbidity Meter Hydrolab
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter —
 D.O. Meter —
 Interface Probe Selast
 PID/OVA Mini RAE 2000
 Pump Geo Pump
 Filler Apparatus N/A

Serial Number R41906
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number 27582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 12 x 40mLField Notebook Site 14 SouthSample Method Low-FlowDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 4-20-05

Well Name <u>W14-2</u>	Screen Interval <u>15-25</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>4.97</u> <u>4.97</u>	4.97	
Project No. <u>1990.088E.0709.31000</u>	Average Water Level (from TOC) <u>4.97 @ 1406</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-20-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziani</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
Sample ID <u>86-544-048</u>	Well Depth MEAS <u>24.70</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Duplicate ID <u>—</u>	Depth of Bottom of Tubing <u>20.0</u>		
	Depth to Water (w/ Tubing in Well) <u>4.97</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1552	0.25	0.61	7.46	-236	21.66	1158	14.9	0.25	—	—	5.15	—
1555	0.20	0.37	7.49	-238	21.47	1162	3.5	0.50	—	—	5.20	—
1558	0.20	0.33	7.49	-241	21.52	1159	4.2	0.75	—	—	5.20	—
1601	0.20	0.30	7.49	-242	21.34	1164	3.7	1.0	—	—	5.30	—
1605	Collect	Sample										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Near drawdown exceedance

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter —
 Turbidity Meter Lamotte 2020
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter —
 D.O. Meter —
 Interface Probe Solinst
 PID/OVA Mini RAE 3000
 Pump Ecopump
 Filter Apparatus N/A

Serial Number R41906
 Serial Number —
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number —
 Serial Number 87582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 6 x 40 mL
 Field Notebook Site 14 South
 Sample Method Low Flow
 Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 4-20-05

Well Name <u>W14-3</u>	Screen Interval <u>15-30</u>	Station Elevation <u>---</u> GND <u>---</u> TOC <u>---</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.74</u> <u>5.74</u>	5.74	
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>5.74 @ 1434</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-20-05</u>	Reference Elevation <u>---</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Graziani</u>	Static Elevation <u>---</u>	Notes _____	
Sample ID <u>86-514-049</u>	Well Depth MEAS <u>30.17</u> RPTD <u>---</u>	Feet of Water <u>---</u>	
Duplicate ID _____	Depth of Bottom of Tubing <u>22.0</u>		
	Depth to Water (w/ Tubing in Well) <u>5.74</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1445	0.3	0.77	7.61	-196	20.39	1120	21.0	0.25	---	---	5.78	---
1448	0.3	0.44	7.66	-210	20.60	1113	8.2	0.50	---	---	5.92	---
1451	0.2	0.29	7.72	-212	20.80	1116	6.7	0.75	---	---	6.00	---
1454	0.15	0.26	7.72	-223	20.72	1113	5.7	1.0	---	---	6.11	---
Drawdown Exceedance but parameters stable. Will allow recovery then sample												
1500	Collect	Sample										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Drawdown Exceedance

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter LaMotte 2020
 Turbidity Meter Hydrolab
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter MiniRAE2000
 D.O. Meter MiniRAE2000
 Interface Probe MiniRAE2000
 PID/OVA MiniRAE2000
 Pump Eco Pump
 Filter Apparatus N/A

Serial Number R41906
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number 27582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 6 x 40mL
 Field Notebook Site 14 South
 Sample Method LOW FLOW
 Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 4-20-05

Well Name <u>W14-11</u>	Screen Interval <u>8-20</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.74</u> <u>5.74</u> <u>5.74</u>	Average Water Level (from TOC) <u>5.74 @ 1415</u>	
Project No. <u>1990.086E.0709.31000</u>	Reference Point <u>TDC</u>	PID Readings (background) <u>0.0</u>	
Well Location <u>Moffett Field - Site 14</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sample Date <u>4-21-05</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziant</u>	Well Depth MEAS <u>19.29</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Sample ID <u>86-S14-051</u>	Depth of Bottom of Tubing <u>14.0</u>		
Duplicate ID <u>—</u>	Depth to Water (w/ Tubing in Well) <u>5.79</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0928	0.2	0.74	7.21	-94	18.92	2340	0.9	0.25	—	—	5.83	—
0931	0.2	0.36	7.22	-157	19.10	2342	0.1	0.50	—	—	5.84	—
0934	0.2	0.22	7.01	-179	19.39	2342	0.5	0.75	—	—	5.84	—
0937	0.2	0.20	7.19	-197	19.57	2340	0.0	1.0	—	—	5.84	—
0940	0.2	0.17	7.20	-201	19.96	2344	0.0	1.25	—	—	5.84	—
0945	Collect Sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: _____

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab

Temperature Meter —

Turbidity Meter LaMotte 2020

Spec. Elec. Cond. Meter Hydrolab

ORP Meter —

D.O. Meter —

Interface Probe Solinst

PID/OVA MinikAE 2000

Pump 6cc Pump

Filter Apparatus N/A

Serial Number R41906

Serial Number —

Serial Number 3164-1602

Serial Number R41906

Serial Number —

Serial Number 27582

Serial Number 003204

Serial Number A99001962

Number of Bottles 6 x 40 mLField Notebook Site 14 SouthSample Method —low flowDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 4-20-05

Well Name <u>W14-10</u>	Screen Interval <u>13-20</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.13</u> <u>5.13</u> <u>5.13</u>		
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>5.13 @ 1427</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-21-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziani</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
Sample ID <u>86-514-050</u>	Well Depth MEAS <u>19.07</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Duplicate ID <u>—</u>	Depth of Bottom of Tubing <u>16.0</u>		
	Depth to Water (w/ Tubing in Well) <u>5.15</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0858	0.2	1.82	7.02	136	18.41	3073	1.5	0.25	—	—	5.49	—
0901	0.2	1.79	7.03	140	18.56	3080	1.3	0.50	—	—	5.49	—
0904	0.2	1.75	7.03	143	18.63	3083	1.2	0.75	—	—	5.49	—
0905	Collect	Sample										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

0.2	0.2											
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Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Exceed Drawdown. Obtain one set of readings, allow recharge, then sample.

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter —
 Turbidity Meter LaMotte 2020
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter —
 D.O. Meter —
 Interface Probe Solinst
 PID/OVA MiniRAE 3000
 Pump Geopump
 Filter Apparatus N/A

Serial Number R41906
 Serial Number —
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number —
 Serial Number —
 Serial Number 27582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 6 x 40mLField Notebook Site 14 SouthSample Method LOW-FLOWDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page ____ of ____

Date 4-20-05

Well Name <u>W14-12</u>	Screen Interval <u>13-20</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q1/05</u>	Static Water Level (from TOC) / Time <u>5.68</u> <u>5.68</u>	5.68	
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>5.68 @ 1412</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>4-20-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziant</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
Sample ID <u>86-S14-052</u>	Well Depth MEAS <u>19.21</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Duplicate ID <u>—</u>	Depth of Bottom of Tubing <u>16.0</u>		
	Depth to Water (w/ Tubing in Well) <u>5.70</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1520	0.2	0.64	6.95	-125	20.80	1569	13.7	0.25	—	—	5.78	—
1523	0.2	0.42	6.93	-134	20.64	1574	5.7	0.50	—	—	5.75	—
1526	0.2	0.22	6.92	-147	20.39	1600	6.0	0.75	—	—	5.73	—
1529	0.2	0.19	6.92	-151	20.29	1599	5.5	1.0	—	—	5.73	—
1532	0.2	0.18	6.73	-152	20.26	1601	5.7	1.25	—	—	5.73	—
1535	Collect	Sample										

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
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SAMPLE RATE

0.2	0.2						
-----	-----	--	--	--	--	--	--

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: _____

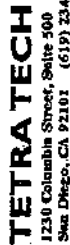
Remarks: _____

FIELD EQUIPMENT

pH Meter Hydralab
 Temperature Meter —
 Turbidity Meter Lamotte 2020
 Spec. Elec. Cond. Meter Hydralab
 ORP Meter —
 D.O. Meter —
 Interface Probe Solinst
 PID/OVA MiniRAE 3000
 Pump GeoPump
 Filter Apparatus N/A

Serial Number R41906
 Serial Number —
 Serial Number 3164-1602
 Serial Number R41906
 Serial Number —
 Serial Number 27582
 Serial Number 003204
 Serial Number A99001962

Number of Bottles 6 x 40 mL
 Field Notebook Site 14 South
 Sample Method Low Flow
 Discharge Water Containerized ☒ Yes ☐ No



CHAIN-OF-CUSTODY RECORD

White - Laboratory: Pink - Laboratory: Canary - Project File: Manila - Data Management



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 7-21-05

Well Name <u>ERM-2</u>	Screen Interval <u>14-19</u>	Station Elevation <u>-</u> GND <u>-</u> TOC <u>-</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.09</u> <u>6.09</u> <u>6.09</u>	Average Water Level (from TOC) <u>6.09 @ 0759</u>	
Project No. <u>1990.086E.0709.31000</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Well Location <u>Moffett Field - Site 14</u>	Reference Elevation <u>-</u>	PID Reading (TOC) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Static Elevation <u>-</u>	Notes _____	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziani</u>	Well Depth MEAS <u>15.96</u> RPTD <u>-</u>	Feet of Water _____	
Sample ID <u>86-514-055</u>	Depth of Bottom of Tubing <u>14</u>		
Duplicate ID _____	Depth to Water (w/ Tubing in Well) <u>6.10</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1048	0.2	7.8	7.63	-324	22.30	1376	9.7	0.25	-	-	6.19	-
1051	0.2	3.7	7.45	-331	22.30	1362	6.4	0.50	-	-	6.17	-
1054	0.2	2.8	7.48	-334	21.08	1369	5.9	0.75	-	-	6.17	-
1057	0.2	2.3	7.52	-336	21.88	1375	6.0	1.0	-	-	6.17	-
1100	0.2	2.4	7.53	-336	21.79	1377	5.8	1.25	-	-	6.17	-
1105	Collect	Sample										

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
SAMPLE RATE							
0.2	0.2						

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: _____

Remarks: _____

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Number of Bottles <u>6 x 40 mL</u>
Temperature Meter <u>↓</u>	Serial Number <u>↓</u>	
Turbidity Meter <u>LaMotte 2020</u>	Serial Number <u>3694-4002</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Field Notebook <u>Site 14</u>
ORP Meter <u>↓</u>	Serial Number <u>↓</u>	Sample Method <u>LOW FLOW</u>
D.O. Meter <u>↓</u>	Serial Number <u>↓</u>	
Interface Probe <u>Solinst</u>	Serial Number <u>27582</u>	
PID/OVA <u>MiniRAE 2000</u>	Serial Number <u>004208</u>	
Pump <u>GeoPump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 7-21-05

Well Name <u>ERM-3</u>	Screen Interval <u>16-21</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.48</u> <u>6.48</u>	6.48	
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>6.48 @ 0813</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
<u>P. Braziani</u>	Well Depth MEAS <u>20.75</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Sample ID <u>86-S14-056</u>	Depth of Bottom of Tubing <u>18</u>		
Duplicate ID <u>—</u>	Depth to Water (w/ Tubing in Well) <u>6.45</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1116	0.2	6.7	7.45	-332	22.95	1370	7.3	0.25	—	—	6.60	—
1119	0.2	4.8	7.34	-328	23.16	1369	8.3	0.50	—	—	6.57	—
1122	0.2	3.9	7.31	-350	23.13	1360	7.4	0.75	—	—	6.56	—
1125	0.2	3.3	7.29	-350	22.93	1380	7.3	1.0	—	—	6.58	—
1128	0.2	3.1	7.28	-354	23.05	1385	7.1	1.25	—	—	6.58	—
1130	Collect sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
-----------	-----------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: _____

Remarks: _____

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter ↓
 Turbidity Meter Lamotte 2020
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter ↓
 D.O. Meter ↓
 Interface Probe Solinst
 PID/OVA MiniRAE 2000
 Pump 600 pump
 Filter Apparatus N/A

Serial Number R41759
 Serial Number ↓
 Serial Number 3694-4002
 Serial Number R41759
 Serial Number ↓
 Serial Number ↓
 Serial Number 27582
 Serial Number 004708
 Serial Number 899001962

Number of Bottles 6 x 40mLField Notebook Site 14Sample Method Low-FlowDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 7-21-05

Well Name <u>W14-2</u>	Screen Interval <u>15-25</u>	Station Elevation <u>---</u> GND <u>---</u> TOC <u>---</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.00</u> <u>6.00</u> <u>6.00</u>	Average Water Level (from TOC) <u>6.00</u> <u>0753</u>	
Project No. <u>1990.086E.0709.31000</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Well Location <u>Moffett Field - Site 14</u>	Reference Elevation <u>---</u>	PID Reading (TOC) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Static Elevation <u>---</u>	Notes _____	
Sampling Personnel <u>B. Bartelma</u> <u>P. Graziani</u>	Well Depth MEAS <u>24.40</u> RPTD <u>---</u>	Feet of Water _____	
Sample ID <u>86-S14-057</u>	Depth of Bottom of Tubing <u>20.0</u>		
Duplicate ID <u>86-S14-058</u>	Depth to Water (w/ Tubing in Well) <u>6.00</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1144	0.2	9.3	7.65	-384	23.38	1198	8.3	0.25	---	---	6.05	---
1147	0.2	3.3	7.57	-397	23.06	1185	7.3	0.50	---	---	6.15	---
1150	0.2	2.8	7.56	-402	22.53	1192	8.7	0.75	---	---	6.30	---
1153	0.2	2.6	7.57	-402	22.42	1194	8.4	1.0	---	---	6.30	---
1155	collect	sample										
1200	collect	duplicate										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
-----------	-----------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: collect duplicate

Remarks: _____

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Number of Bottles <u>12 x 40mL</u>
Temperature Meter <u>↓</u>	Serial Number <u>↓</u>	
Turbidity Meter <u>LaMotte 2020</u>	Serial Number <u>3694-4002</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Field Notebook <u>Site 14 South</u>
ORP Meter <u>↓</u>	Serial Number <u>↓</u>	Sample Method <u>Low Flow</u>
D.O. Meter <u>↓</u>	Serial Number <u>27582</u>	
Interface Probe <u>Solinist</u>	Serial Number <u>004208</u>	
PID/OVA <u>MiniRAE 2000</u>	Serial Number <u>A99001962</u>	
Pump <u>GeoPump</u>		
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Date 7-21-05

Well Name <u>W14-3</u>	Screen Interval <u>15-30</u>	Station Elevation <u>-</u> GND <u>-</u> TOC <u>-</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.67</u> <u>6.67</u> <u>6.67</u>	Average Water Level (from TOC) <u>6.67 @ 0807</u>	
Project No. <u>1990.086E.0709.31000</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Well Location <u>Moffett Field - Site 14</u>	Reference Elevation <u>-</u>	PID Reading (TOC) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Static Elevation <u>-</u>	Notes <u></u>	
Sampling Personnel <u>B. Bartelma</u> <u>P. Braziani</u>	Well Depth MEAS <u>30.17</u> RPTD <u>-</u>	Feet of Water <u></u>	
Sample ID <u>86-514-059</u>	Depth of Bottom of Tubing <u>22.5</u>	Depth to Water (w/ Tubing in Well) <u>6.67</u>	
Duplicate ID <u></u>			

PURGING

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 U/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
-----------	-----------	--	--	--	--	--	--

SAMPLE RATE

0.7	0.7						
-----	-----	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well:

Remarks:

FIELD EQUIPMENT

Number of Bottles	6 x 40 mL
Field Notebook	Site 14
Sample Method	Low-Flow
Discharge Water Containerized	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Discharge Water Containerized ☒ Yes ☐ No



Page _____ of _____

Date 7-21-05

Well Name	W14-10		Screen Interval	13-20		Immiscible Phases Present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project	UST Site 14 Q3/Q5		Station Elevation	- GND - TOC -			
Project No.	1990.086E.0709.31000		Static Water Level (from TOC) / Time	6.42 6.42 6.42			
Well Location	Moffett Field - Site 14		Average Water Level (from TOC)	6.42 @ 0810			
Sample Date	7-21-05		Reference Point	TOC		PID Readings (background)	0.0
Sampling Personnel	B. Bartelma P. Braziani		Reference Elevation	-		PID Reading (TOC)	0.0
			Static Elevation	-		Notes	
			Well Depth MEAS	19.26 RPTD -		Feet of Water	
Sample ID	86-514-060		Depth of Bottom of Tubing	16.5			
Duplicate ID	86-514-060		Depth to Water (w/ Tubing in Well)	6.41			

[illegible]

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS							
EPA 8360B	EPA 8015B						

SAMPLE RATE							
0.2	0.2						

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well:

Remarks:

FIELD EQUIPMENT

pH Meter	Hydrolab
Temperature Meter	↓
Turbidity Meter	LAMOTTE 2020
Spec. Elec. Cond. Meter	Hydrolab
ORP Meter	↓
D.O. Meter	
Interface Probe	Solinst
PID/OVA	Mini RAE 2000
Pump	GEOPUMP
Filter Apparatus	N/A

Serial Number R41759
Serial Number ↓
Serial Number 3694-4002
Serial Number R41759
Serial Number ↓
Serial Number 37582
Serial Number 004308
Serial Number A99001962

Number of Bottles 6

Field Notebook Site 14

Sample Method Box-Flow

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 7-21-05

Well Name <u>W14-11</u>	Screen Interval <u>8-20</u>	Station Elevation <u>-</u> GND <u>-</u> TOC <u>-</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.75</u> <u>6.75</u> <u>6.75</u>		
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>6.75 @ 0804</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Reference Elevation <u>-</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Barfelma</u>	Static Elevation <u>-</u>	Notes _____	
<u>P. Braziani</u>	Well Depth MEAS <u>19.19</u> RPTD <u>-</u>	Feet of Water _____	
Sample ID <u>86-514-061</u>	Depth of Bottom of Tubing <u>14</u>		
Duplicate ID _____	Depth to Water (w/ Tubing in Well) <u>6.72</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1012	0.2	9.5	7.24	-453	21.62	1513	4.8	0.25	-	-	6.82	-
1015	0.2	3.9	7.13	-501	21.86	1572	3.0	0.50	-	-	6.79	-
1018	0.2	3.7	7.12	-514	22.11	1570	5.5	0.75	-	-	6.79	-
1021	0.2	2.5	7.11	-517	22.37	1555	5.4	1.0	-	-	6.79	-
1024	0.2	2.3	7.13	-518	22.32	1560	5.5	1.25	-	-	6.79	-
1025	Collect Sample											

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
-----------	-----------	--	--	--	--	--	--	--	--	--	--	--

SAMPLE RATE

0.2	0.2											
-----	-----	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Strong Odors in Purge Water | collect MS/MSD

Remarks: _____

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Number of Bottles <u>10 x 40 mL</u>
Temperature Meter <u>↓</u>	Serial Number <u>↓</u>	
Turbidity Meter <u>LaMotte 2020</u>	Serial Number <u>3694-4002</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Field Notebook <u>Site 14</u>
ORP Meter <u>↓</u>	Serial Number <u>↓</u>	Sample Method <u>LOW-Flow</u>
D.O. Meter <u>↓</u>	Serial Number <u>↓</u>	
Interface Probe <u>Solinst</u>	Serial Number <u>37582</u>	
PID/OVA <u>MiniRAE 2000</u>	Serial Number <u>004108</u>	
Pump <u>Geo Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



TETRA TECH FW, INC.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEET

Page _____ of _____

Date 7-21-05

Well Name <u>W14-12</u>	Screen Interval <u>13-20</u>	Station Elevation <u>—</u> GND <u>—</u> TOC <u>—</u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 Q3/05</u>	Static Water Level (from TOC) / Time <u>6.67</u> <u>6.67</u> <u>6.67</u>		
Project No. <u>1990.086E.0709.31000</u>	Average Water Level (from TOC) <u>6.67 @ 0757</u>		
Well Location <u>Moffett Field - Site 14</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0.0</u>	
Sample Date <u>7-21-05</u>	Reference Elevation <u>—</u>	PID Reading (TOC) <u>0.0</u>	
Sampling Personnel <u>B. Bartelma</u>	Static Elevation <u>—</u>	Notes <u>—</u>	
<u>P. Graziani</u>	Well Depth MEAS <u>19.22</u> RPTD <u>—</u>	Feet of Water <u>—</u>	
Sample ID <u>86-S14-062</u>	Depth of Bottom of Tubing <u>16.5</u>		
Duplicate ID <u>—</u>	Depth to Water (w/ Tubing in Well) <u>6.68</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0932	0.2	8.3	7.31	-340	20.64	1542	8.9	0.25	—	—	6.75	—
0935	0.2	3.9	7.12	-366	20.60	1554	8.5	0.50	—	—	6.74	—
0938	0.2	2.5	7.08	-385	20.57	1561	8.8	0.75	—	—	6.71	—
0941	0.2	2.3	7.07	-390	20.56	1559	7.7	1.0	—	—	6.73	—
0944	0.2	2.1	7.05	-393	20.53	1557	7.5	1.25	—	—	6.73	—
0950	Collect	Sample										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
SAMPLE RATE							
0.2	0.2						

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: _____

Remarks: _____

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41759</u>	Number of Bottles <u>6</u>
Temperature Meter <u>↓</u>	Serial Number <u>3694-4002</u>	
Turbidity Meter <u>LaMotte 2020</u>	Serial Number <u>R41759</u>	Field Notebook <u>Site 14</u>
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>↓</u>	Sample Method <u>Low-Flow</u>
ORP Meter <u>↓</u>	Serial Number <u>27582</u>	
D.O. Meter <u>↓</u>	Serial Number <u>004209</u>	
Interface Probe <u>Solinset</u>	Serial Number <u>A99001962</u>	
PID/OVA <u>MiniRAE 2000</u>		
Pump <u>GeoPump</u>		
Filter Apparatus <u>N/A</u>		

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 10809

CHAIN-OF-CUSTODY RECORD

PROJECT NAME UST Site 14		PURCHASE ORDER NO. 20848 Task 33		ANALYSES REQUIRED				LABORATORY NAME EMAX		Project Information Section Do not submit to Laboratory	
PROJECT LOCATION Moffett Field, CA		PROJECT NO. 1990.0865						LABORATORY ID (FOR LABORATORY)			
SAMPLER NAME Peter Giagioni		AIRBILL NUMBER 851128684442						COMMENTS		LOCATION	
PROJECT CONTACT LYAN Jefferson		PROJECT CONTACT PHONE NUMBER 414-156-1558								DEPTH START END	
SAMPLE ID		DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3 4	T V P E	T A T			QC	
86-S14-053	7-21-05	0700	6	X	X	W	10 DAY	X	EPA 31608 (env) (MT 96)	X	Reg.
86-S14-059	7-21-05	0850	6	X	X	W	10 DAY	X	EPA 30158 (TPT 10)	X	Reg.
86-S14-060	7-21-05	0920	6	X	X	W	10 DAY	X		X	Reg.
86-S14-062	7-21-05	0950	6	X	X	W	10 DAY	X		X	Reg.
86-S14-061	7-21-05	1025	10	X	X	W	10 DAY	X	MS/MSD	X	Reg.
86-S14-055	7-21-05	1105	6	X	X	W	10 DAY	X		X	Reg.
86-S14-056	7-21-05	1130	6	X	X	W	10 DAY	X		X	Reg.
86-S14-057	7-21-05	1155	6	X	X	W	10 DAY	X		X	Reg.
86-S14-058	7-21-05	1200	6	X	X	W	10 DAY	X		X	Reg.
7-21-06											
RELINQUISHED BY (Signature) 10/20/06		DATE 7-21	RECEIVED BY (Signature) 10/20/06		LABORATORY INSTRUCTIONS/COMMENTS		SAMPLING COMMENT: Site 14 Q3/05				
COMPANY TREC		TIME 1400	COMPANY								
RELINQUISHED BY (Signature)		DATE	RECEIVED BY (Signature)		COMPOSITE DESCRIPTION						
COMPANY		TIME	COMPANY								
RELINQUISHED BY (Signature)		DATE	RECEIVED BY (Signature)		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)						
COMPANY		TIME	COMPANY		TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN						
					COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN						



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 12/17/05Well Name ERM-2Project MFA - Site 14 - R3/05Project No. 1990.086EWell Location Site 14Sample Date 12/18/05Sampling Personnel D. NavisScreen Interval 14-19Station Elevation GND TOCStatic Water Level (from TOC) / Time 6.37/043 6.37/044 6.37/045Average Water Level (from TOC) 6.37Reference Point TOC

Reference Elevation

Static Elevation

Well Depth MEAS 15.67 RPTD 15.96Depth of Bottom of Tubing 14.5Depth to Water (w/ Tubing in Well) 6.37Immiscible Phases Present ☐ Yes ☒ NoPID Readings (background) OppuPID Reading (TOC) Oppu

Notes

Feet of Water

Sample ID 86-S14-063Duplicate ID N/A

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0946	.4	1.33	7.5	29	22.6	1622	3.5	.2			6.39	
0949	.4	0.30	7.4	24	22.5	1629	4.8	.4			6.40	
0952	.4	0.22	7.4	26	22.4	1636	3.2	.4			6.42	
0955	.4	0.19	7.4	26	22.3	1645	2.8	.8			6.44	
0958	.1	0.18	7.3	27	22.3	1651	1.4	1.0			6.45	
1000	Collect Sample											

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOC's	TPH/P	Cations	Anions				
-------	-------	---------	--------	--	--	--	--

SAMPLE RATE

.1	.1	.4	.4				
----	----	----	----	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - Note: T.D. is supposed to be 19' - actual is 15.67, screen interval is supposed to be 14-19'.

Remarks: Clear/odorless

FIELD EQUIPMENT

pH Meter Hydrolab

Temperature Meter "

Turbidity Meter La Motte

Spec. Elec. Cond. Meter Hydrolab

ORP Meter "

D.O. Meter "

Interface Probe Solinst

PID/OVA Mini Rae

Pump Geo Pump

Filter Apparatus N/A

Serial Number 241334

Serial Number "

Serial Number La Motte

Serial Number 241334

Serial Number "

Serial Number "

Serial Number 25582

Serial Number 00320

Serial Number BA0041

Number of Bottles 6 x 40 mL

2 x 500 mL

Field Notebook Pg 82+83Sample Method Low FlowDischarge Water Containerized ☒ Yes ☐ No



Date 10/17/05

Well Name <u>ERM-3</u>	Screen Interval _____	Station Elevation _____ GND _____ TOC _____	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>Site 14 - R3/05</u>	Static Water Level (from TOC) / Time <u>6.70/1109</u> <u>6.70/1110</u> <u>6.70/1111</u>	Average Water Level (from TOC) <u>6.70</u>	
Project No. <u>1990-036E</u>	Reference Point <u>76C</u>	PID Readings (background) <u>Open</u>	
Well Location <u>Site 14 - Moffett</u>	Reference Elevation _____	PID Reading (TOC) <u>Open</u>	
Sample Date <u>10/18/05</u>	Static Elevation _____	Notes _____	
Sampling Personnel <u>D. Harrison</u>	Well Depth MEAS <u>20.49</u> RPTD <u>20.8</u>	Feet of Water _____	
Sample ID <u>86-514-065</u>	Depth of Bottom of Tubing _____		
Duplicate ID <u>N/A</u>	Depth to Water (w/ Tubing in Well) <u>6.70</u>		

[illegible]

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be < 0.33 foot

SAMPLE PARAMETERS							
VOC'S	TPN-p	Catrans	Arions				
SAMPLE RATE							
1 C/m	1 C/m	4 C/m	4 C/m				

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good
Remarks: clear / odorless

FIELD EQUIPMENT

pH Meter	Hydrolab	Serial Number	241334	Number of Bottles	2 x 1000
Temperature Meter	"	Serial Number	"		2 x 500
Turbidity Meter	La Motte	Serial Number	La Motte	Field Notebook pg	84
Spec. Elec. Cond. Meter	Hydrolab	Serial Number	241334	Sample Method	Low flow
ORP Meter	"	Serial Number	"		
D.O. Meter	"	Serial Number	"		
Interface Probe	Salinst	Serial Number	25582		
PID/OVA	Mini Rae	Serial Number	20320		
Pump	Gre pump	Serial Number	BA0041		
Filter Apparatus	N/A			Discharge Water Containerized	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



LOW-FLOW GROUNDWATER SAMPLING DATA SHEET

Date 10/17/05

Well Name <u>W14-2</u>	Screen Interval <u>15-25</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>MFA - Site 14 G.W.-R3/35</u>	Static Water Level (from TOC) / Time <u>6.32/1053</u> <u>6.32/1054</u> <u>6.32/1055</u>	Average Water Level (from TOC) <u>6.32</u>	
Project No. <u>1490.086E</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0</u>	
Well Location <u>Site 14</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0</u>	
Sample Date <u>10/18/05</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sampling Personnel <u>J. Harrison</u>	Well Depth MEAS <u>24.40</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sample ID <u>86-ST4-067</u>	Depth of Bottom of Tubing <u>20</u>	Depth to Water (w/ Tubing in Well) <u>6.32</u>	
Duplicate ID <u>N/A</u>			

PURGING

[illegible]

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

SAMPLE PARAMETERS					
VOIS	TAN-p	Cations	Anions		
SAMPLE RATE					
0.1 L/m	0.1	0.4	0.4		

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - N 2' bgs

Condition of Well: Good - N2 bubbles
Remarks: Clear - N2S odor - VOC + TPH-p samples effervesced

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter "
 Turbidity Meter La Motte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter "
 D.O. Meter "
 Interface Probe Salust
 PID/OVA Mini Race
 Pump Geor Pump
 Filter Apparatus N/A

Serial Number	R41334
Serial Number	"
Serial Number	La Motte
Serial Number	R41334
Serial Number	"
Serial Number	"
Serial Number	25582
Serial Number	00320
Serial Number	BA0041

Number of Bottles 6 x 40 mL V
2 x SLP

Field Notebook Pg. 83

Sample Method Pg. 83

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 10/17/05Well Name WJ4-3Project Site 14 G.W. - Rd 3/05Project No. 1990.086EWell Location Site 14 - MoffettSample Date 10/17/05

Sampling Personnel

D. HarrisonScreen Interval 15-30Station Elevation GND TOC TOCImmiscible Phases Present ☐ Yes ☒ NoStatic Water Level (from TOC) / Time 7.02/1105 7.02/1106 7.02/1107Average Water Level (from TOC) 7.02

Reference Point

PID Readings (background) 0

Reference Elevation

PID Reading (TOC) 0

Static Elevation

Notes

Well Depth MEAS 29.90 RPTD

Feet of Water

Sample ID 86-S14-068Duplicate ID 86-S14-069

Depth of Bottom of Tubing

Depth to Water (w/ Tubing in Well) 7.02

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1455	.4	0.48	7.3	174	27.8	1251	6.1	.2			7.06	
1458	.4	0.30	7.4	120	28.4	1297	4.4	.4			7.11	
1501	.4	0.21	7.4	82	24.1	1305	3.2	.6			7.16	
* 1504	.4	0.18	7.5	70	23.4	1331	3.6	.8			7.19	
1507	.2	0.15	7.5	56	23.4	1307	4.0	.9			7.21	
1510	.2	0.14	7.5	52	23.6	1301	3.4	1.0			7.22	
1513	.2	0.13	7.5	49	23.8	1296	3.5	1.1			7.22	
1515	Collect	Sample										
1525	Collect	Field Duplicate										

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOC's	TPH	Cations	Anions				
-------	-----	---------	--------	--	--	--	--

SAMPLE RATE

.1	.1	.2	.2				
----	----	----	----	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well:

* Remarks: Drawing down quickly - reduced flow rate

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter "
 Turbidity Meter La Motte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter "
 D.O. Meter "
 Interface Probe Solinst
 PID/OVA Mini Roe
 Pump Geo Pump
 Filter Apparatus N/A

Serial Number R41334
 Serial Number "
 Serial Number La Motte
 Serial Number R41334
 Serial Number "
 Serial Number "
 Serial Number 0025582
 Serial Number 00320
 Serial Number BA0041

Number of Bottles 12 x 40 mL V
4 x 16 L

Field Notebook pg. 79Sample Method Low flowDischarge Water Containerized ☒ Yes ☐ No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 10/17/05

Well Name <u>W14-10</u>	Screen Interval <u>13-20</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>MFA - Site 14-R3/05</u>	Static Water Level (from TOC) / Time <u>6.68/1112</u> <u>6.68/1113</u> <u>6.68/1114</u>	Average Water Level (from TOC) <u>6.68</u>	PID Readings (background) <u>Oppm</u>
Project No. <u>1990.086E</u>	Reference Point <u>TOC</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>Oppm</u>
Well Location <u>Moffett - Site 14</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sample Date <u>10/18/05</u>	Well Depth MEAS <u>11.0</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sampling Personnel <u>D. Harvish</u>	Depth of Bottom of Tubing <u>16.5</u>	Depth to Water (w/ Tubing in Well) <u>6.68</u>	
Sample ID <u>86-S14-070</u>			
Duplicate ID <u>N/A</u>			

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1352	.4	0.44	6.8	235	24.0	2077	1.6	.2			6.70	
1355	.4	0.30	6.7	231	23.8	2100	1.1	.4			6.72	
1358	.4	0.19	6.8	227	23.2	2097	0.9	.6			6.74	
1401	.4	0.16	6.8	225	23.2	2095	1.0	.8			6.76	
1404	.4	0.15	6.8	222	23.2	2086	1.5	1.0			6.77	
1407	.4	0.14	6.8	221	23.2	2084	1.1	1.2			6.78	
1410	Collect Sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOCs	TPHP	Cations	Anions				
SAMPLE RATE							
.1	.1	.4	.4				

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: GoodRemarks: Clear - odorless

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter "
 Turbidity Meter La Motte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter "
 D.O. Meter "
 Interface Probe Solinst
 PID/OVA Mini Roe
 Pump Geo Pump
 Filter Apparatus N/A

Serial Number R41334
 Serial Number "
 Serial Number La Motte
 Serial Number R41334
 Serial Number "
 Serial Number "
 Serial Number 25582
 Serial Number 00320
 Serial Number BA 0041

Number of Bottles 6x 40mL
2x 65LA

Field Notebook Sample Method Low FlowDischarge Water Containerized ☒ Yes ☐ No

LOW-FLOW GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 10/17/05

Well Name <u>W14-11</u>	Screen Interval <u>8-20</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>MFA - Site 14 - R3/05</u>	Static Water Level (from TOC) / Time <u>7.07/1048</u> <u>7.07/1048</u> <u>7.07/1049</u>	Average Water Level (from TOC) <u>7.07</u>	PID Readings (background) <u>0</u>
Project No. <u>1990-086</u>	Reference Point <u>TOC</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0</u>
Well Location <u>Site 14 - End 3/05</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sample Date <u>10/18/05</u>	Well Depth MEAS <u>18.94</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sampling Personnel <u>D. Morrison</u>	Depth of Bottom of Tubing <u>14</u>	Depth to Water (w/ Tubing in Well) <u>7.07</u>	
Sample ID <u>86-319-071</u>			
Duplicate ID <u>N/A</u>			

[illegible]

Notes:

1. Purga rate = 0.2 - 0.5 U/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

POC'S	TPH	Carbon	Ambion				
SAMPLE RATE							
.1	.1	.4	.4				

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: Clear - H₂S odor

FIELD EQUIPMENT

pH Meter Hydrolab
Temperature Meter "
Turbidity Meter La Motte
Spec. Elec. Cond. Meter Hydrolab
ORP Meter "
D.O. Meter "
Interface Probe Solinst
PID/OVA Mini Dose
Pump Geopump
Filter Apparatus N/A

Serial Number	R41834
Serial Number	11
Serial Number	La Motte
Serial Number	R41834
Serial Number	11
Serial Number	11
Serial Number	00320
Serial Number	25582
Serial Number	BA0041

Number of Bottles 8 - 6 x 40 mL V
2 x 1 L P

Field Notebook Pg. 82

Sample Method LOW FLOW

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 10/17/05

Well Name W14-12
 Project MPA-Site 14 G.W. R3/05
 Project No. 1990.086E
 Well Location Site 14
 Sample Date 10/18/05
 Sampling Personnel D. Harrison

Screen Interval 13-20Station Elevation GND TOC Immiscible Phases Present ☐ Yes ☒ NoStatic Water Level (from TOC) / Time 7.00/1051 7.00/1051 7.00/1052Average Water Level (from TOC) 7.00Reference Point TOC PID Readings (background) 0Reference Elevation PID Reading (TOC) 0Static Elevation Notes Well Depth MEAS RPTD Feet of Water Sample ID 86-S14-072Depth of Bottom of Tubing 16.5Duplicate ID N/ADepth to Water (w/ Tubing in Well) 7.00

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0755	.4	0.86	6.9	297	19.4	1976	1.8	.1			7.03	
0758	.4	0.34	4.9	147	19.5	1953	1.5	.3			7.04	
0801	.4	0.27	6.9	115	19.7	1920	1.4	.5			7.05	
0804	.4	0.23	6.7	92	19.7	1921	1.2	.7			7.06	
0807	.4	0.22	6.9	84	20.1	1923	1.0	.9			7.06	
0810	.4	0.21	6.9	85	19.6	1932	1.2	1.1			7.07	
0812	Collected Sample											

Notes:

1. Purge rate = 0.2 - 0.5 L/minute

2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

VOC'S	TPH	Cations	Anions				
-------	-----	---------	--------	--	--	--	--

SAMPLE RATE

.1	.1	.4	.4				
----	----	----	----	--	--	--	--

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute

2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - rustyRemarks: Clear / colorless

FIELD EQUIPMENT

pH Meter Hydrolab
 Temperature Meter "
 Turbidity Meter LaMotte
 Spec. Elec. Cond. Meter Hydrolab
 ORP Meter "
 D.O. Meter "
 Interface Probe Mini Rae
 PID/OVA Schust
 Pump Geopump
 Filter Apparatus N/A

Serial Number R41334
 Serial Number "
 Serial Number LaMotte
 Serial Number R41334
 Serial Number "
 Serial Number "
 Serial Number 00320
 Serial Number 25582
 Serial Number BA0041

Number of Bottles 8Field Notebook Pg. 81Sample Method LOW FLOWDischarge Water Containerized ☐ Yes ☐ No



Page 1 of 1

Date 10/17/05

Well Name W14-13
Project MFA - Site 14 - R3105
Project No. 1990.CS6C
Well Location Site 14
Sample Date 10/18/05
Sampling Personnel D. Harrison

Screen Interval 15-20
Station Elevation GND TOC Immiscible Phases Present ☐ Yes ☒ No
Static Water Level (from TOC) / Time 7.16/1123 7.16/1124 7.16/1125
Average Water Level (from TOC) 7.16
Reference Point TOC PID Readings (background) Appn
Reference Elevation PID Reading (TOC) Appn
Static Elevation Notes
Well Depth MEAS 19.74 RPTD Feet of Water
Depth of Bottom of Tubing 17.5
Depth to Water (w/ Tubing in Well) 7.16

Sample ID 86-S14-073
Duplicate ID N/A

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

SAMPLE PARAMETERS					
Var's	TAN- ϕ	Capacitors	Amplifiers		
SAMPLE RATE					
0.12/deg	0.1	0.4	0.4		

Notes

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: Clear / no clear PSS

FIELD EQUIPMENT

pH Meter	Hydrolab
Temperature Meter	"
Turbidity Meter	La Motte
Spec. Elec. Cond. Meter	Hydrolab
ORP Meter	"
D.O. Meter	"
Interface Probe	Solinst
PID/OVA	Mini Rae
Pump	Geo pump
Filter Apparatus	N/A

Serial Number	R41334
Serial Number	"
Serial Number	La Motte
Serial Number	R41334
Serial Number	"
Serial Number	"
Serial Number	25582
Serial Number	00320
Serial Number	B40041

Number of Bottles 6 x 40mLV
2 x 5LP

Field Notebook Pgs. 82 + 83

Sample Method Low flow

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH

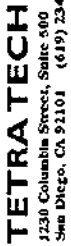
1230 Colubia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

CHAIN-OF-CUSTODY RECORD

NUMBER 10841

PROJECT NAME Site 14 R3/05		PURCHASE ORDER NO. 20848 - Truck 33		ANALYSES REQUIRED										LABORATORY NAME CWA X		Project Information Section Do not submit to Laboratory								
PROJECT LOCATION Ms. Goff		PROJECT NO. 1990-086E												LABORATORY ID (FOR LABORATORY)										
SAMPLER NAME D. Harrison		AIRBILL NUMBER 851128684008																						
PROJECT CONTACT Lynda Jefferson		PROJECT CONTACT PHONE NUMBER 949-756-7500																						
SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL	T	P	A	T	COMMENTS										LOCATION	DEPTH	QC			
				3 4	E															START	END			
86-S14-063	10/17/05	1505	6	X					10 day	X	X	X	X	X	X	X	X	Trap Black			TB			
86-S14-068	10/17/05	1515	8	X					10 day	X	X	X	X	X	X	X	X	W14-3			Reg			
86-S14-069	10/17/05	1525	8	X					10 day	X	X	X	X	X	X	X	X	W14-3			FD			
86-S14-072	10/19/05	0812	8	X					10 day	X	X	X	X	X	X	X	X	W14-12			Reg			
86-S14-071	10/19/05	0900	8	X					10 day	X	X	X	X	X	X	X	X	W14-11			Reg			
86-S14-065	10/19/05	1000	8	X					10 day	X	X	X	X	X	X	X	X	ERM-2			Reg			
86-S14-073	10/19/05	1050	8	X					10 day	X	X	X	X	X	X	X	X	W14-13			Reg			
																	LABORATORY INSTRUCTIONS/COMMENTS			SAMPLING COMMENT: Site 14 G.W. R3/05				
RELINQUISHED BY (Signature)		DATE		TIME		RECEIVED BY (Signature)		DATE		TIME		COMPOSITE DESCRIPTION												
COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		COMPANY														
RELINQUISHED BY (Signature)		DATE		TIME		RECEIVED BY (Signature)		DATE		TIME														
COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		COMPANY														
RELINQUISHED BY (Signature)		DATE		TIME		RECEIVED BY (Signature)		DATE		TIME		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)												
COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN												
COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		COMPANY		COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN												

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management



NUMBER 10342

CHAIN-OF-CUSTODY RECORD

[illegible]



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1/16/06

Well Name <u>ERM-2</u>	Screen Interval <u>14-19</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Project <u>UST Site 14 R4/06</u>	Static Water Level (from TOC) / Time <u>3.10/0909</u> <u>3.10/0910</u> <u>3.10/0911</u>		
Project No. <u>1990.086E</u>	Average Water Level (from TOC) <u>3.10</u>		
Well Location <u>MFA</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0 ppm</u>	
Sample Date <u>1/16/05</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0 ppm</u>	
Sampling Personnel <u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>	
<u>B. Ogle</u>	Well Depth MEAS <u>15.68</u> RPTD <u>15.96</u>	Feet of Water <u> </u>	
Sample ID <u>86-S14-074</u>	Depth of Bottom of Tubing <u>14.5</u>		
Duplicate ID <u>N/A</u>	Depth to Water (w/ Tubing in Well) <u>3.10</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1050	.4	1.3	7.0	286	19.6	2236	1.4	.2			3.13	
1053	.4	0.93	7.0	243	19.7	2237	0.6	.4			3.14	
1056	.4	0.22	7.0	231	19.7	2238	0.6	.6			3.16	
1059	.4	0.18	7.0	236	19.8	2239	0.2	.8			3.17	
1102	.4	0.16	7.0	232	19.9	2238	0.4	1.0			3.16	
1105	Collect Sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
SAMPLE RATE												
.1	.1											

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good except T.D.Remarks: Clear / odorless

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>6x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook <u> </u>
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Site <u>14</u>
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

LOW-FLOW GROUNDWATER SAMPLING DATA SHEET

Page 1 of 1

Date 1-16-66

Well Name <u>ERM-3</u>	Screen Interval _____	
Project <u>UST Site 14 R406</u>	Station Elevation _____ GND _____ TOC _____	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project No. <u>1990.086E</u>	Static Water Level (from TOC) / Time <u>3.55 / 0912</u>	<u>3.55 / 0913</u> <u>3.55 / 0914</u>
Well Location <u>MFA</u>	Average Water Level (from TOC) <u>3.53</u>	
Sample Date <u>1/16-06</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>Oppm</u>
Sampling Personnel _____	Reference Elevation _____	PID Reading (TOC) <u>Oppm</u>
<u>D. Harrison</u>	Static Elevation _____	Notes _____
<u>B. Ogle</u>	Well Depth MEAS <u>20.49</u> RPTD <u>20.49</u>	Feet of Water _____
Sample ID <u>86-S14-075</u>	Depth of Bottom of Tubing _____	
Duplicate ID _____	Depth to Water (w/ Tubing in Well) <u>3.55</u>	

PURGING

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
SAMPLE RATE							

Notes:

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: Clear / Sulphur Odor

FIELD EQUIPMENT

pH Meter	<u>Hydrolab</u>	Serial Number	<u>R41045</u>	Number of Bottles	<u>6x40mLV</u>
Temperature Meter	<u>Hydrolab</u>	Serial Number	<u>R41045</u>		
Turbidity Meter	<u>LaMotte</u>	Serial Number	<u>LaMotte</u>		
Spec. Elec. Cond. Meter	<u>Hydrolab</u>	Serial Number	<u>R41045</u>	Field Notebook	
ORP Meter	<u>Hydrolab</u>	Serial Number	<u>R41045</u>	Site 14	
D.O. Meter	<u>Hydrolab</u>	Serial Number	<u>R41045</u>	Sample Method	<u>Low Flow</u>
Interface Probe	<u>Solinst</u>	Serial Number	<u>5716</u>		
PID/OVA	<u>Mini-Rae</u>	Serial Number	<u>00320</u>		
Pump	<u>Geo-Pump</u>	Serial Number	<u>A99001962</u>		
Filter Apparatus	<u>N/A</u>			Discharge Water Containerized	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1-16-06

Well Name <u>W14-2</u>	Screen Interval <u>15-25</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 R406</u>	Static Water Level (from TOC) / Time <u>3.04/0923</u> <u>3.05/0924</u> <u>3.05/0925</u>	Average Water Level (from TOC) <u>3.05</u>	
Project No. <u>1990.086E</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>Oppm</u>	
Well Location <u>MFA</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>Oppm</u>	
Sample Date <u>1-16-06</u>	Static Elevation <u> </u>	Notes <u> </u>	
Sampling Personnel <u>D. Harrison</u>	Well Depth MEAS <u>24.40</u> RPTD <u> </u>	Feet of Water <u> </u>	
<u>B. Ogile</u>	Depth of Bottom of Tubing <u>20</u>		
Sample ID <u>86-S14-076</u>	Depth to Water (w/ Tubing in Well) <u>3.05</u>		
Duplicate ID <u>N/A</u>			

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1517	.4	0.37	7.3	44	21.3	1925	14.2	.2			3.10	
1520	.4	0.24	7.4	9	21.2	1920	66.6	.4			3.12	
1523	.4	0.17	7.3	8	21.2	1919	66.8	.6			3.14	
1524	.4	0.16	7.3	7	21.1	1922	66.1	.8			3.16	
1530	Collect Sample											

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
SAMPLE RATE												
.1 L/min	.1 L/min											

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - N 1/8" gas -Remarks: Slight black / Heavy H₂S odor - Turned to heavy grn/yellow bio
All SAMPLES EFFERESCED

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>6x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook <u> </u>
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	<u>Site 14</u>
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1-16-06

Well Name <u>W14-3</u>	Screen Interval <u>15-30</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 R4/06</u>	Static Water Level (from TOC) / Time <u>4.02/0938</u> <u>4.02/0939</u> <u>4.02/0940</u>		
Project No. <u>1990.086E</u>	Average Water Level (from TOC) <u>4.02</u>		
Well Location <u>MFA</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0 ppm</u>	
Sample Date <u>1-17-06</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0 ppm</u>	
Sampling Personnel <u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>	
<u>B. Ogle</u>	Well Depth MEAS <u>29.90</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sample ID <u>86-S14-077</u>	Depth of Bottom of Tubing <u>22.5</u>		
Duplicate ID <u> </u>	Depth to Water (w/ Tubing in Well) <u>4.02</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	EH/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
0840	.4	0.80	7.8	53	18.6	1779	6.6	1.2			4.05	
0843	.4	0.66	7.8	46	18.8	1794	12.4	.4			4.09	
0846	.4	0.24	7.8	31	19.0	1813	9.3	.6			4.11	
0849	.4	0.22	7.8	28	19.0	1828	7.6	.8			4.13	
0852	.4	0.16	7.8	26	19.1	1845	7.8	1.0			4.16	
0855	Collected	Sample										

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
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SAMPLE RATE

.1 L/min	.1 L/min											
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Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: GoodRemarks: Slight black/odorless

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>6x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook <u> </u>
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	<u>Site 14</u>
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



Page 1 of 1

Date 1-16-06

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
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SAMPLE RATE

1	2						
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Notes:

1. Sample rate for VOCs analysis = $0.1 \cdot 0.2$ L/minute
2. Sample rate for non-VOCs analysis = purge rate = $0.2 \cdot 0.5$ L/minute

Condition of Well: Good - RUN MS/MSD

Remarks: Clear / Odorless

FIELD EQUIPMENT

pH Meter Hydrolab Serial Number R41045 Number of Bottles 6x40mLV

Temperature Meter Hydrolab Serial Number R41045

Turbidity Meter LaMotte Serial Number LaMotte

Spec. Elec. Cond. Meter Hydrolab Serial Number R41045 Field Notebook _____

ORP Meter Hydrolab Serial Number R41045 Site 14 _____

D.O. Meter Hydrolab Serial Number R41045 Sample Method Low Flow

Interface Probe Sollinst Serial Number 5716

PID/OVA Mini-Rae Serial Number 00320

Pump Geo-Pump Serial Number A99001962

Filter Apparatus N/A

Discharge Water Containerized ☒ Yes ☐ No

Discharge Water Containerized ☒ Yes ☐ No



TETRA TECH EC, Inc.

LOW-FLOW GROUNDWATER
SAMPLING DATA SHEETPage 1 of 1Date 1/16/06

Well Name <u>W14-11</u>	Screen Interval <u>8-20</u>	Station Elevation <u>GND</u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project <u>UST Site 14 R4/06</u>	Static Water Level (from TOC) / Time <u>3.77/0948</u> <u>3.77/0949</u> <u>3.77/0950</u>		
Project No. <u>1990.086E</u>	Average Water Level (from TOC) <u>3.77</u>		
Well Location <u>MFA</u>	Reference Point <u>Top</u>	PID Readings (background) <u>0ppm</u>	
Sample Date <u>1-16-06</u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0ppm</u>	
Sampling Personnel <u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>	
<u>B. Ogle</u>	Well Depth MEAS <u>18.96</u> RPTD <u> </u>	Feet of Water <u> </u>	
Sample ID <u>86-S14-079</u>	Depth of Bottom of Tubing <u>14</u>		
Duplicate ID <u>86-S14-080</u>	Depth to Water (w/ Tubing in Well) <u>3.77</u>		

PURGING

Time	Discharge Rate ¹ (L/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp. (°C)	Specific Conduct. (µmhos/cm at °C)	Turbidity (NTU)	Cumulative Volume of Water Removed/Purged (Gallons)	PID/OVA Reading		Depth to Water ² (ft)	Comments
									Location	Value		
1345	.4	0.65	7.2	-40	19.9	2306	3.4	.2			3.79	
1348	.4	0.62	7.1	-77	19.8	2297	1.7	.4			3.79	
1351	.4	0.27	7.2	-96	19.6	2271	1.6	.4			3.79	
1354	.4	0.18	7.1	-98	19.5	2285	1.8	.8			3.81	
1357	.4	0.11	7.1	-103	19.4	2283	0.4	1.0			3.81	
1400	Collect	Sample										
1410	Collect	Field Dip										

Notes:

- Purge rate = 0.2 - 0.5 L/minute
- Drawdown shall be <0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B											
SAMPLE RATE												
.1 L/min	.1 L/min											

Notes:

- Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
- Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: GoodRemarks: Clear / H₂S odor

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>12x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook <u> </u>
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Site <u>14</u>
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



Page 1 of 1

Date 1-16-06

Well Name <u>W14-12</u>	Screen Interval <u>13-20</u>
Project <u>UST Site 14 R4/06</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u> Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project No. <u>1990.086E</u>	Static Water Level (from TOC) / Time <u>3.78/0943</u> <u>3.78/0944</u> <u>3.78/0945</u>
Well Location <u>MFA</u>	Average Water Level (from TOC) <u>TOC - 3.78</u>
Sample Date <u>1-16-06</u>	Reference Point <u>5' B. TOC</u>
Sampling Personnel <u> </u>	PID Readings (background) <u>App.</u>
<u>D. Harrison</u>	PID Reading (TOC) <u>App.</u>
<u>B. Ogle</u>	Notes <u> </u>
Sample ID <u>86-S14-081</u>	Well Depth MEAS <u>16.49</u> RPTD <u> </u>
Duplicate ID <u>N/A</u>	Feet of Water <u> </u>
	Depth of Bottom of Tubing <u>16.5</u>
	Depth to Water (w/ Tubing in Well) <u>3.78</u>

[illegible]

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be ≤ 0.33 foot

SAMPLE PARAMETERS

EPA 82608	EPA 80158						
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SAMPLE RATE

r	c	m	z						
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1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good

Remarks: clear / H25.000

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>6x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook _____
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Site 14 _____
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		
		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No



Page 1 of 1

Date 1-16-06

Well Name <u>W14-13</u>	Screen Interval <u>15-20</u>	
Project <u>UST Site 14 R4/06</u>	Station Elevation <u> </u> GND <u> </u> TOC <u> </u>	Immiscible Phases Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Project No. <u>1990.086E</u>	Static Water Level (from TOC) / Time <u>4.09 / 0953</u> <u>4.09 / 0954</u> <u>4.09 / 0955</u>	
Well Location <u>MFA</u>	Average Water Level (from TOC) <u>4.09</u>	
Sample Date <u>1-17-06</u>	Reference Point <u>TOC</u>	PID Readings (background) <u>0ppm</u>
Sampling Personnel <u> </u>	Reference Elevation <u> </u>	PID Reading (TOC) <u>0ppm</u>
<u>D. Harrison</u>	Static Elevation <u> </u>	Notes <u> </u>
<u>B. Ogle</u>	Well Depth MEAS <u>19.75</u> RPTD <u> </u>	Feet of Water <u> </u>
Sample ID <u>86-S14-082</u>	Depth of Bottom of Tubing <u>17.5</u>	
Duplicate ID <u>N/A</u>	Depth to Water (w/ Tubing in Well) <u>4.09</u>	

[illegible]

Notes:

1. Purge rate = 0.2 - 0.5 L/minute
2. Drawdown shall be ≤ 0.33 foot

SAMPLE PARAMETERS

EPA 8260B	EPA 8015B						
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SAMPLE RATE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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Notes

1. Sample rate for VOCs analysis = 0.1 - 0.2 L/minute
2. Sample rate for non-VOCs analysis = purge rate = 0.2 - 0.5 L/minute

Condition of Well: Good - Vault Flooded

Remarks: Clear/Odorless

FIELD EQUIPMENT

pH Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Number of Bottles <u>6x40mLV</u>
Temperature Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	
Turbidity Meter <u>LaMotte</u>	Serial Number <u>LaMotte</u>	
Spec. Elec. Cond. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Field Notebook _____
ORP Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	<u>Site 14</u>
D.O. Meter <u>Hydrolab</u>	Serial Number <u>R41045</u>	Sample Method <u>Low Flow</u>
Interface Probe <u>Solinst</u>	Serial Number <u>5716</u>	
PID/OVA <u>Mini-Rae</u>	Serial Number <u>00320</u>	
Pump <u>Geo-Pump</u>	Serial Number <u>A99001962</u>	
Filter Apparatus <u>N/A</u>		Discharge Water Containerized <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Discharge Water Containerized ☒ Yes ☐ No



NUMBER 10863

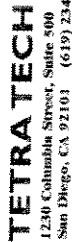
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APPENDIX E

LABORATORY ANALYTICAL DATA PACKAGES
(PROVIDED ON CD ONLY)

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NUMBER 3163

CHAIN-OF-CUSTODY RECORD

PROJECT NAME UST Site 14 Baseline						PURCHASE ORDER NO. 20848 - TASK 33						ANALYSES REQUIRED						LABORATORY NAME EMAX						Project Information Section Do not submit to Laboratory																							
PROJECT LOCATION Moffett						PROJECT NO. 1990.086E																																									
SAMPLER NAME D. Harrison						AIRBILL NUMBER 845907660785																																									
PROJECT CONTACT Lynn Jefferson						PROJECT CONTACT PHONE NUMBER 449/756-7500																																									
SAMPLE ID						DATE COLLECTED						TIME COLLECTED						NO OF CONTAINER						LEVEL						T Y P E						T A T											
																								3						4																	
86-S14-033						1/10/05						1000						6						X						W						10 day						FB					
86-S14-035						1/10/05						1030						6						X						W						10 day						Reg					
86-S14-036						1/10/05						1040						6						X						W						10 day						FD					
86-S14-037						1/10/05						1140						6						X						W						10 day						Reg					
86-S14-038						1/10/05						1335						6						X						W						10 day						Reg					
86-S14-039						1/10/05						1430						18						X						W						10 day						Reg					
86-S14-040						1/10/05						0955						6						X						W						10 day						Reg					
86-S14-041						1/10/05						1045						6						X						W						10 day						Reg					
86-S14-042						1/11/05						1130						6						X						W						10 day						Reg					
86-S14-043						1/11/05						1130						6						X						W						10 day						Reg					
RELINQUISHED BY (Signature) <i>[Signature]</i>						DATE 1/11/05						RECEIVED BY (Signature) <i>[Signature]</i>																																			
COMPANY 7766						TIME 1300						COMPANY																																			
RELINQUISHED BY (Signature)						DATE						RECEIVED BY (Signature)																																			
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White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

CASE NARRATIVE

CLIENT: TETRA TECH FW, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05A070

**SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS**

Nine (9) water samples were received on 01/12/05 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time
Analytical holding time was met.
2. Tuning and Calibration
Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.
3. Method Blank
Method blanks were free of contamination at the reporting limit.
4. Surrogate Recovery
Recoveries were within QC limit.
5. Lab Control Sample/Lab Control Sample Duplicate
Recoveries were within QC limit.
6. Matrix Spike/Matrix Spike Duplicate
Sample A070-06 was spiked. All recoveries were within QC limit.
7. Sample Analysis
Samples were analyzed according to the prescribed QC procedures. All criteria were met.

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/14/05 20:55
Sample ID    : 86-S14-033             Date Analyzed: 01/14/05 20:55
Lab Samp ID  : A070-01                Dilution Factor: 1
Lab File ID  : RAQ297                 Matrix       : WATER
Ext Btch ID  : V005A26                % Moisture    : NA
Calib. Ref.  : RAQ042                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO B6 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 03:30
Sample ID: 86-S14-035                Date Analyzed: 01/15/05 03:30
Lab Samp ID: A070-02                  Dilution Factor: 1
Lab File ID: RAQ308                   Matrix       : WATER
Ext Btch ID: V005A26                  % Moisture    : NA
Calib. Ref.: RAQ042                    Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	107	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-DB	105	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 11:19
Sample ID   : 86-S14-036             Date Analyzed: 01/15/05 11:19
Lab Samp ID : A070-03                Dilution Factor: 1
Lab File ID : RAQ321                 Matrix       : WATER
Ext Btch ID : V005A28                % Moisture   : NA
Calib. Ref. : RAQ042                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MYBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	104	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

Quantitation Report (QT Reviewed)

Data File : D:\HPCHEM\1\DATA\05A14\RAQ321.D Vial: 11
 Acq On : 15 Jan 2005 11:19 am Operator: DN
 Sample : 05A070-03 / 25mL Inst : TO05
 Misc : DF=1.0 Multiplr: 1.00
 MS Integration Params: 524TAIL.P
 Quant Time: Jan 18 11:33 2005 Quant Results File: VO05A05.RES

Quant Method : D:\HPCHEM\1\METHODS\VO05A05.M (RTE Integrator)
 Title : METHOD 8260
 Last Update : Thu Jan 06 11:36:56 2005
 Response via : Initial Calibration
 DataAcq Meth : VO05A05

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	8.61	114	1425810 /	10.00	ug/l	0.00
36) CHLOROBENZENE-D5	14.53	117	1135400 /	10.00	ug/l	0.01
67) 1,2-DICHLOROBENZENE-D4	20.82	152	402871 /	10.00	ug/l	0.00
System Monitoring Compounds						
35) 1,2-Dichloroethane-d4	7.91	65	342142	10.39	ug/l	0.00
Spiked Amount	10.000		Recovery	=	103.90%	
49) Toluene-d8	11.43	98	1568404	10.43	ug/l	0.01
Spiked Amount	10.000		Recovery	=	104.30%	
71) 4-Bromofluorobenzene	17.26	95	501639	10.47	ug/l	0.01
Spiked Amount	10.000		Recovery	=	104.70%	
Target Compounds						
17) Methylene chloride	4.50	49	29614	0.19	ug/l	93
23) 1,1-Dichloroethane	5.55	63	32715	0.44	ug/l	98

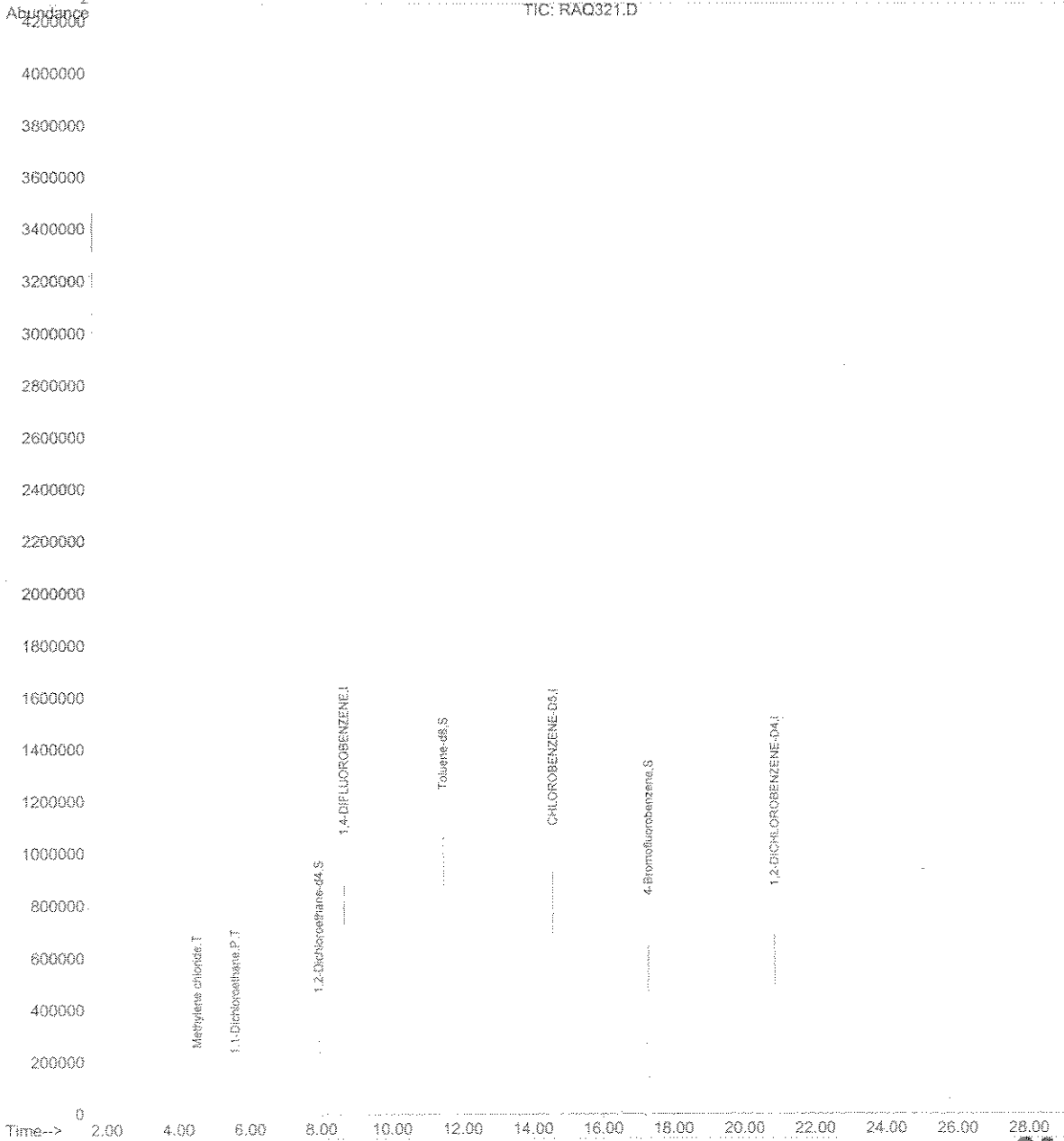
Quantitation Report

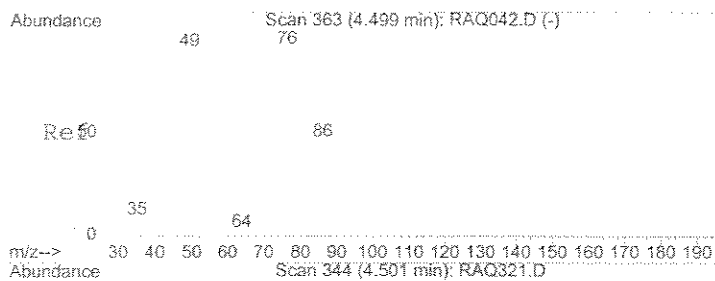
Data File : D:\HPCHEM\1\DATA\05A14\RAQ321.D
Acq On : 15 Jan 2005 11:19 am
Sample : 05A070-03 25mL
Misc : DF=1.0
MS Integration Params: 524TAIL.P
Quant Time: Jan 18 11:33 2005

Vial: 11
Operator: DN
Inst : TO05
Multiplr: 1.00

Quant Results File: VO05A05.RES

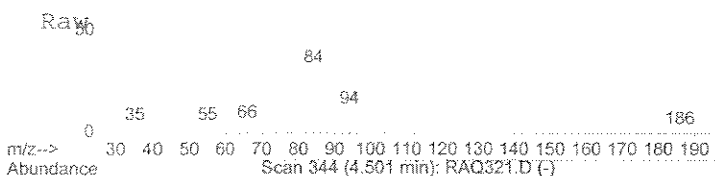
Method : D:\HPCHEM\1\METHODS\VO05A05.M (RTE Integrator)
Title : METHOD 8260
Last Update : Thu Jan 06 11:36:56 2005
Response via : Initial Calibration





#17
Methylene chloride
Concen: 0.19 ug/l
RT: 4.50 min Scan# 344
Delta R.T. 0.00 min
Lab File: RAQ321.D
Acq: 15 Jan 2005 11:19 am

Tgt Ion	Ratio	Lower	Upper
49	100		
84	71.7	47.3	107.3
86	44.3	20.3	80.3



Abundance Ion 49.00 (48.70 to 49.70): RAQ321.D
14000 Ion 84.00 (83.70 to 84.70): RAQ321.D
Ion 86.00 (85.70 to 86.70): RAQ321.D

12000 4.50

10000

8000

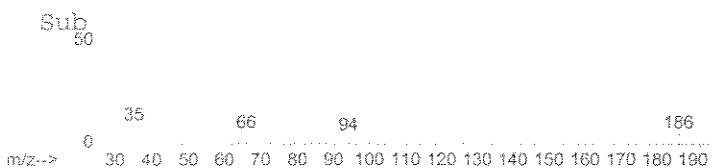
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4000

2000

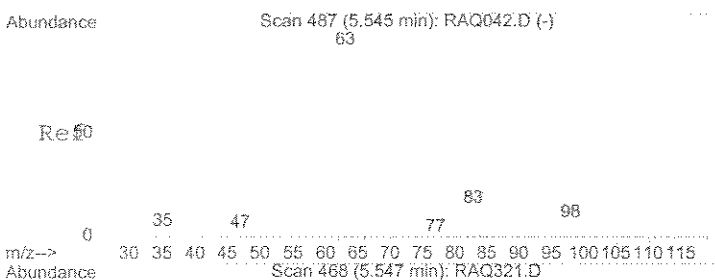
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Time--> 4.40 4.45 4.50 4.55 4.60



#23
1,1-Dichloroethane
Concen: 0.44 ug/l
RT: 5.55 min Scan# 468
Delta R.T. 0.00 min
Lab File: RAQ321.D
Acq: 15 Jan 2005 11:19 am

Tgt Ion	Ratio	Lower	Upper
63	100		
65	31.7	2.6	62.6
83	12.4	0.0	44.1



Abundance Ion 63.00 (62.70 to 63.70): RAQ321.D
Ion 65.00 (64.70 to 65.70): RAQ321.D
Ion 83.00 (82.70 to 83.70): RAQ321.D

10000 5.55

8000

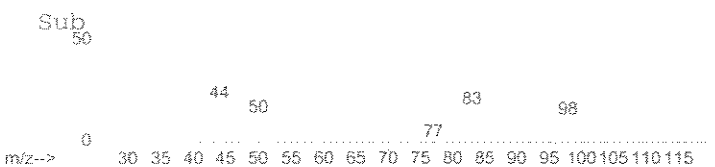
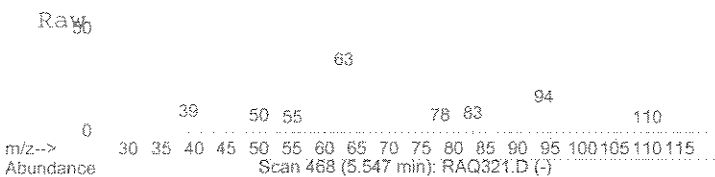
6000

4000

2000

0

Time--> 5.40 5.50 5.60 5.70



SW 5030B/8260B
 VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 11:56
Sample ID: 86-S14-037                Date Analyzed: 01/15/05 11:56
Lab Samp ID: A070-04                 Dilution Factor: 1
Lab File ID: RAQ322                  Matrix       : WATER
Ext Btch ID: V005A2B                 % Moisture    : NA
Calib. Ref.: RAQ042                  Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	110E	1	.2
TOLUENE	4.7	1	.2
ETHYLBENZENE	.46J	1	.2
XYLENES (TOTAL)	10	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	109	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/18/05 19:32
Sample ID   : 86-S14-037DL           Date Analyzed: 01/18/05 19:32
Lab Samp ID : A070-04T                Dilution Factor: 10
Lab File ID : RAQ343                 Matrix       : WATER
Ext Btch ID : V005A29                % Moisture    : NA
Calib. Ref. : RAQ042                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	130	10	2
TOLUENE	5.3J	10	2
ETHYLBENZENE	ND	10	2
XYLENES (TOTAL)	12J	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	GC LIMIT
1,2-DICHLOROETHANE-D4	111	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/20/05 13:35
Sample ID    : 86-S14-038             Date Analyzed: 01/20/05 13:35
Lab Samp ID  : A070-05                 Dilution Factor: 1
Lab File ID  : RAQ401                  Matrix          : WATER
Ext Btch ID  : V005A35                 % Moisture       : NA
Calib. Ref.  : RAQ042                  Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	160E	1	.2
TOLUENE	35	1	.2
ETHYLBENZENE	24	1	.2
XYLENES (TOTAL)	110E	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	125	65-135
BROMOFLUOROBENZENE	113	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/20/05 14:14
Sample ID    : B6-S14-038DL           Date Analyzed: 01/20/05 14:14
Lab Smp ID   : A070-05T                Dilution Factor: 10
Lab File ID  : RAQ402                  Matrix       : WATER
Ext Btch ID  : V005A35                 % Moisture    : NA
Calib. Ref.  : RAQ04Z                  Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	750E	10	2
TOLUENE	37	10	2
ETHYLBENZENE	25	10	2
XYLENES (TOTAL)	120	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC           Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.   : 05A070                      Date Extracted: 01/22/05 11:56
Sample ID   : 86-S14-038DL                Date Analyzed: 01/22/05 11:56
Lab Samp ID : A070-051                    Dilution Factor: 2000
Lab File ID : RAQ472                      Matrix       : WATER
Ext Btch ID : V005A41                     % Moisture    : NA
Calib. Ref. : RAQ042                      Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	9800	2000	400
TOLUENE	ND	2000	400
ETHYLBENZENE	ND	2000	400
XYLENES (TOTAL)	ND	6000	1000
MTBE	ND	2000	400

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	107	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 5030B/8260B
 VOLATILE ORGANICS BY GC/MS

```

=====
Client   : TETRA TECH FW, INC      Date Collected: 01/10/05
Project  : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No. : 05A070                Date Extracted: 01/18/05 20:10
Sample ID: 86-S14-039             Date Analyzed: 01/18/05 20:10
Lab Samp ID: A070-06R              Dilution Factor: 1
Lab File ID: RAQ344                Matrix       : WATER
Ext Btch ID: V005A29               % Moisture   : NA
Calib. Ref.: RAQ042                Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	108	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/18/05 20:47
Sample ID: 86-S14-040                Date Analyzed: 01/18/05 20:47
Lab Samp ID: A070-07R                Dilution Factor: 1
Lab File ID: RAQ345                  Matrix           : WATER
Ext Btch ID: V005A29                 % Moisture       : NA
Calib. Ref.: RAQ042                  Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-DB	101	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 13:09
Sample ID: 86-S14-041                 Date Analyzed: 01/15/05 13:09
Lab Samp ID: A070-08                   Dilution Factor: 1
Lab File ID: RA0324                     Matrix       : WATER
Ext Btch ID: V005A28                     % Moisture    : NA
Calib. Ref.: RA0042                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	110	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/11/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/15/05 13:46
Sample ID:   86-S14-042                Date Analyzed: 01/15/05 13:46
Lab Samp ID: A070-09                   Dilution Factor: 1
Lab File ID: RAQ325                     Matrix       : WATER
Ext Btch ID: V005A28                   % Moisture    : NA
Calib. Ref.: RAQ042                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	105	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

CASE NARRATIVE

CLIENT: TETRA TECH FW, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05A070

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Nine (9) water samples were received on 01/12/05 for Total Petroleum Hydrocarbons by Purge and Trap analysis by Method 5030B/M8015 in accordance with SW846 3rd Edition.

1. Holding Time

Analytical holding time was met. Water samples were preserved.

2. Calibration

Initial calibration was seven points. %RSD was within 20%. Continuing calibrations were carried out at 12-hour intervals and at the end of the analysis sequence. All recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at the reporting limit.

4. Surrogate Recovery

Surrogate recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample A070-06 spiked with this SDG. All recoveries were within QC limits

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Results were quantified from C₆ to C₁₀ using GRO (C₆ - C₁₀) calibration factor.

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 02:17
Sample ID   : 86-S14-033             Date Analyzed: 01/13/05 02:17
Lab Samp ID : A070-01                 Dilution Factor: 1
Lab File ID : EA12027A                Matrix          : WATER
Ext Btch ID : VA39A11                 % Moisture       : NA
Calib. Ref. : EA12019A                Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	101	65-135	

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 02:51
Sample ID    : 86-S14-035                  Date Analyzed: 01/13/05 02:51
Lab Samp ID  : A070-02                     Dilution Factor: 1
Lab File ID  : EA12028A                    Matrix       : WATER
Ext Btch ID  : VA39A11                     % Moisture    : NA
Calib. Ref.  : EA12019A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	86	65-135	

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 03:24
Sample ID    : 86-S14-036                  Date Analyzed: 01/13/05 03:24
Lab Samp ID  : A070-03                     Dilution Factor: 1
Lab File ID  : EA12029A                    Matrix       : WATER
Ext Btch ID  : VA39A11                     % Moisture    : NA
Calib. Ref.  : EA12019A                    Instrument ID : GC1039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
-----	-----	-----	
BROMOFLUOROBENZENE	93	65-135	

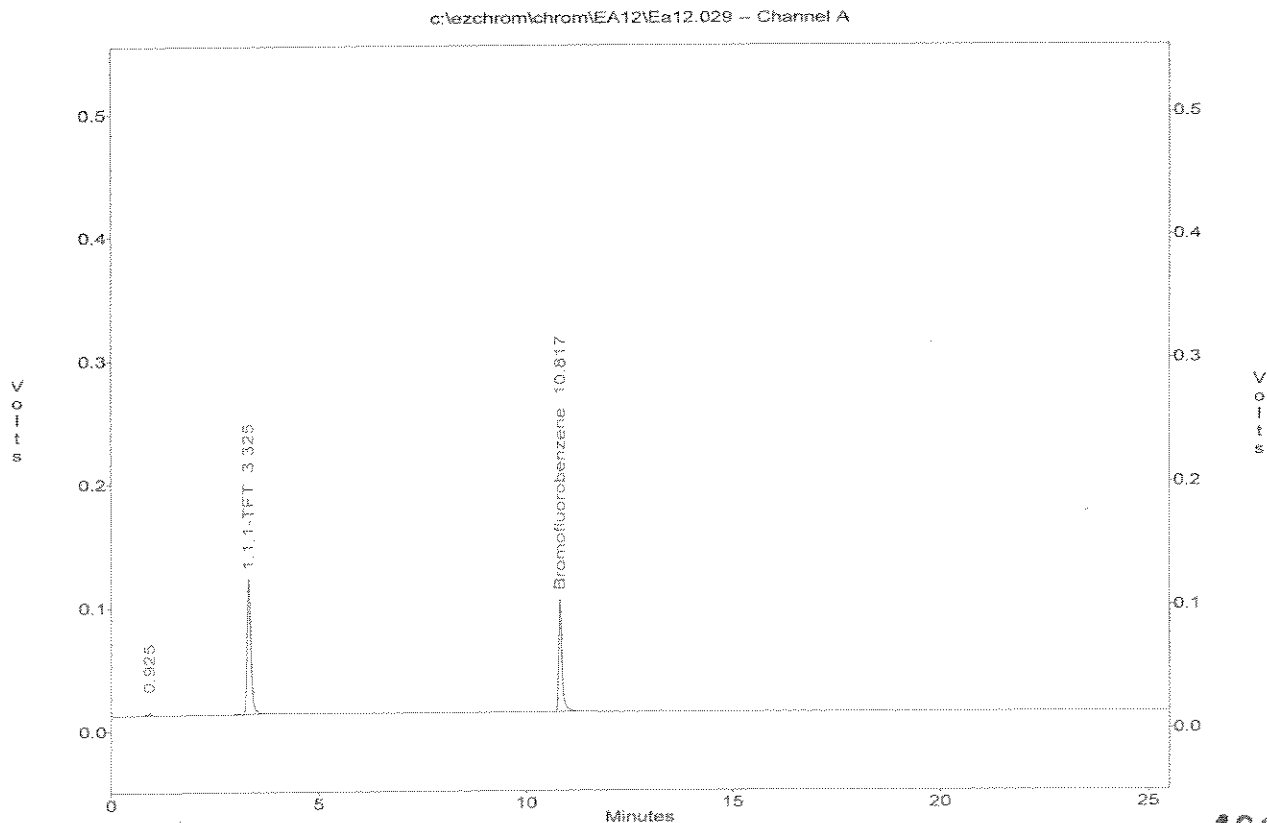
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EA12\Ea12.029
Method : c:\ezchrom\methods\Vg39k29.met
Sample ID : 05A070-03 5.0ML W
Acquired : Jan 13, 2005 03:24:49
Printed : Jan 13, 2005 03:50:21
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
2	1,1,1-TFT	3.325	737485.0	18909.3	39.00
3	Bromofluorobenzene	10.817	534494.0	14418.9	37.07
G1	GASOLINE (TOTAL)		0.0	16078.3	0.00
G2	GRO (C6-C10)		0.0	13283.6	0.00
G3	GRO (2MP-124TMB)		0.0	13342.3	0.00
G4	GRO (C5-C12)		0.0	15919.9	0.00



4007

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 03:58
Sample ID: 86-S14-037                Date Analyzed: 01/13/05 03:58
Lab Samp ID: A070-Q4                  Dilution Factor: 1
Lab File ID: EA12030A                 Matrix       : WATER
Ext Btch ID: VA39A11                 % Moisture    : NA
Calib. Ref.: EA12019A                 Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
GASOLINE	.22	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
-----	-----	-----
BROMOFLUOROBENZENE	124	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 04:32
Sample ID:   86-S14-038                    Date Analyzed: 01/13/05 04:32
Lab Samp ID: A070-05T                      Dilution Factor: 5
Lab File ID: EA12031A                     Matrix       : WATER
Ext Btch ID: VA39A11                      % Moisture    : NA
Calib. Ref.: EA12019A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	3.2	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	132	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 06:13
Sample ID: 86-S14-039                 Date Analyzed: 01/13/05 06:13
Lab Samp ID: A070-Q6                  Dilution Factor: 1
Lab File ID: EA12034A                 Matrix       : WATER
Ext Stch ID: VA39A11                  % Moisture    : NA
Calib. Ref.: EA12032A                 Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	93	65-135	

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 07:55
Sample ID: 86-S14-040                Date Analyzed: 01/13/05 07:55
Lab Samp ID: A070-07                  Dilution Factor: 1
Lab File ID: EA12037A                 Matrix       : WATER
Ext Btch ID: VA39A11                  % Moisture    : NA
Calib. Ref.: EA12032A                 Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	101	65-135	

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/11/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 08:29
Sample ID:   86-S14-041                    Date Analyzed: 01/13/05 08:29
Lab Samp ID: A070-08                       Dilution Factor: 1
Lab File ID: EA12038A                      Matrix       : WATER
Ext Btch ID: VA39A11                       % Moisture    : NA
Calib. Ref.: EA12032A                      Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.48	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	120	65-135	

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/11/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 10:29
Sample ID:   86-S14-042                    Date Analyzed: 01/13/05 10:29
Lab Samp ID: A070-09W                      Dilution Factor: 1
Lab File ID: EA12041A                      Matrix          : WATER
Ext Btch ID: VA39A11                       % Moisture       : NA
Calib. Ref.: EA12032A                      Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
-----	-----	-----	
BROMOFLUOROBENZENE	94	65-135	

RL : Reporting Limit

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, MAF, CTO 86

Collection Date: January 10 through January 11, 2005

LDC Report Date: February 14, 2005

Matrix: Water

Parameters: Total Petroleum Hydrocarbons as Gasoline

Validation Level: EPA Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05A070

Sample Identification

86-S14-033
86-S14-035
86-S14-036**
86-S14-037
86-S14-038
86-S14-039
86-S14-040
86-S14-041
86-S14-042
86-S14-042MS
86-S14-042MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

Samples 86-S14-035 and 86-S14-036** were identified as field duplicates. No total petroleum hydrocarbons as gasoline were detected in any of the samples.

X. Field Blanks

Sample 86-S14-033 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

Moffett Airfield, UST Site 14, MAF, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG
05A070

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, MAF, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification
Summary - SDG 05A070

No Sample Data Qualified in this SDG

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                       Date Extracted: 01/13/05 02:17
Sample ID    : 86-S14-033                   Date Analyzed: 01/13/05 02:17
Lab Samp ID  : A070-Q1                      Dilution Factor: 1
Lab File ID  : EA12027A                     Matrix          : WATER
Ext Btch ID  : VA39A11                      % Moisture       : NA
Calib. Ref.  : EA12019A                     Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	101	65-135	

RL : Reporting Limit

Handwritten signature/initials
2/15/05

4004

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 02:51
Sample ID   : 86-S14-035              Date Analyzed: 01/13/05 02:51
Lab Samp ID : A070-02                 Dilution Factor: 1
Lab File ID : EA12028A                Matrix       : WATER
Ext Btch ID : VA39A11                 % Moisture    : NA
Calib. Ref. : EA12019A                Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
-----	-----	-----
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

2/15/05

4005

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 03:24
Sample ID:   86-S14-036                    Date Analyzed: 01/13/05 03:24
Lab Samp ID: A070-03                       Dilution Factor: 1
Lab File ID: EA12029A                      Matrix       : WATER
Ext Btch ID: VA39A11                       % Moisture    : NA
Calib. Ref.: EA12019A                      Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	93	65-135	

RL : Reporting Limit

Handwritten signature
2/15/05

4006

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MPA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/13/05 03:58
Sample ID    : 86-S14-037             Date Analyzed: 01/13/05 03:58
Lab Samp ID  : A070-04                 Dilution Factor: 1
Lab File ID  : EA12030A                Matrix       : WATER
Ext Btch ID  : VA39A11                 % Moisture    : NA
Calib. Ref.  : EA12019A                Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.22	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	124	65-135	

RL : Reporting Limit

Handwritten: 2/15/05

4008

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/13/05 04:32
Sample ID    : 86-S14-038             Date Analyzed: 01/13/05 04:32
Lab Samp ID  : A070-05T               Dilution Factor: 5
Lab File ID  : EA12031A               Matrix       : WATER
Ext Btch ID  : VA39A11                % Moisture    : NA
Calib. Ref.  : EA12019A               Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
-----	-----	-----	-----
GASOLINE	3.2	.5	.1
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
-----	-----	-----	
BROMOFLUOROBENZENE	132	65-135	

RL : Reporting Limit

2/15/05

4009

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 06:13
Sample ID    : 86-S14-039                  Date Analyzed: 01/13/05 06:13
Lab Samp ID  : A070-06                     Dilution Factor: 1
Lab File ID  : EA12034A                    Matrix       : WATER
Ext Btch ID  : VA39A11                     % Moisture    : NA
Calib. Ref.  : EA12032A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	93	65-135	

RL : Reporting Limit

2/15/05

4010

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/11/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 07:55
Sample ID    : 86-S14-040                  Date Analyzed: 01/13/05 07:55
Lab Samp ID  : A070-07                     Dilution Factor: 1
Lab File ID  : EA12037A                    Matrix       : WATER
Ext Btch ID  : VA39A11                     % Moisture    : NA
Calib. Ref.  : EA12032A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	101	65-135	

RL : Reporting Limit

2/15/05

METHOD 5030B/MS015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 01/11/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/12/05
Batch No.    : 05A070                      Date Extracted: 01/13/05 08:29
Sample ID:   86-S14-041                    Date Analyzed: 01/13/05 08:29
Lab Samp ID: A070-08                       Dilution Factor: 1
Lab File ID: EA12038A                      Matrix       : WATER
Ext Btch ID: VA39A11                       % Moisture    : NA
Calib. Ref.: EA12032A                      Instrument ID : GCTG39
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.48	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	120	65-135

RL : Reporting Limit

2/15/05

4012

METHOD 50308/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/13/05 10:29
Sample ID   : 86-S14-042             Date Analyzed: 01/13/05 10:29
Lab Samp ID : A070-09W               Dilution Factor: 1
Lab File ID : EA12041A              Matrix       : WATER
Ext Btch ID : VA39A11               % Moisture    : NA
Calib. Ref. : EA12032A              Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	94	65-135	

RL : Reporting Limit

2/15/05

4013

LDC #: 13124A7

VALIDATION COMPLETENESS WORKSHEET

Date: 2/11/05


SDG #: 05A070

Level III/IV

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: JVG

2nd Reviewer: **METHOD:** GC TPH as Gasoline (EPA SW846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/10 - 11/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	CCV/ICV $\leq 15\%$
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 2, 3
X.	Field blanks	ND	TB = 1

Note: A = Acceptable

ND = No compounds detected

D = Duplicate

N = Not provided/applicable R = Rinsate

TB = Trip blank

SW = See worksheet

FB = Field blank

EB = Equipment blank

Water

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-033	TB	11	86-S14-042MSD	21		31	
2	86-S14-035	I	12	MBLKIN	22		32	
3	86-S14-036**	I	13		23		33	
4	86-S14-037		14		24		34	
5	86-S14-038		15		25		35	
6	86-S14-039		16		26		36	
7	86-S14-040		17		27		37	
8	86-S14-041		18		28		38	
9	86-S14-042		19		29		39	
10	86-S14-042MS		20		30		40	

Notes:

LDC #: 13124A7
SDG #: DS A070

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVG
2nd Reviewer: g

Method: <u>GC</u> <u>HPLC</u>	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u>1</u> %D or %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 13124 A7
SDG #: 05A07D

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JVC
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field duplicates?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Were field blanks identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [Signature]

LDC #: 13124 A7
SDG #: 05 A070

METHOD: GC ✓ HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = $100 \cdot (S/X)$
A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported		Recalculated		Reported		Recalculated	
				CF (1000 std)	CF (1000 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD	%RSD	%RSD
1	1 CAL	11/29/04	Gasoline	16857	16857	16078.3	16078.3	7.9	7.9	7.6	7.6
2											
3											
4											

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1214A7
SDG #: 054670

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [Signature]

METHOD: GC ✓ HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 \times (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
CF = A/C CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	EA 12019A	1/12/05	Gasoline	500	526.88	5	526.88	5
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13124 A7
SDG #: 05 A070

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: JVB
2nd reviewer: 9

METHOD: ☒ GC ☐ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \cdot 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 3

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
BFB	DB-5	40	37.67	93	94	1

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

METHOD: GC HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

$$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$$
 Where
 SSC = Spiked sample concentration
 SA = Spike added

$$\text{RPD} = (((\text{SSCMS} - \text{SSCMSD}) * 2) / (\text{SSCMS} + \text{SSCMSD})) * 100$$
 MS = Matrix spike
 MSD = Matrix spike duplicate
 SC = Sample concentration
 SSC = Sample concentration

$$RPD = (((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD)) * 100$$
MS/MSD samples: b/1[illegible]

10.0% of the recalculated results.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, MAF, CTO 86

Collection Date: January 10 through January 11, 2005

LDC Report Date: February 14, 2005

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05A070

Sample Identification

86-S14-033
86-S14-035
86-S14-036**
86-S14-037
86-S14-037DL
86-S14-038
86-S14-038DL1
86-S14-038DL2
86-S14-039
86-S14-040
86-S14-041
86-S14-042
86-S14-039MS
86-S14-039MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles including Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), and Methyl-tert-butyl Ether (MTBE).

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0% .

Average relative response factors (RRF) for all were within method criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

For the purposes of technical evaluation, all compounds were evaluated against the 20.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration RRF values were within method criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
86-S14-037 86-S14-038DL1	Benzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
86-S14-038	Benzene Xylenes, total	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

Samples and 86-S14-035 and 86-S14-036** were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Sample 86-S14-033 was identified as a trip blank. No volatile contaminants were found in this blank.

Moffett Airfield, UST Site 14, MAF, CTO 86
Volatiles - Data Qualification Summary - SDG 05A070

SDG	Sample	Compound	Flag	A or P	Reason
05A070	86-S14-037 86-S14-038DL1	Benzene	J (all detects)	A	Compound quantitation and CRQLs
05A070	86-S14-038	Benzene Xylenes, total	J (all detects) J (all detects)	A	Compound quantitation and CRQLs

Moffett Airfield, UST Site 14, MAF, CTO 86
Volatiles - Laboratory Blank Data Qualification Summary - SDG 05A070

No Sample Data Qualified in this SDG

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/14/05 20:55
Sample ID   : 86-S14-033             Date Analyzed: 01/14/05 20:55
Lab Samp ID : A070-01                Dilution Factor: 1
Lab File ID : RAQ297                 Matrix       : WATER
Ext Btch ID : V005A26                % Moisture   : NA
Calib. Ref. : RAQ042                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2004

2/15/08

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 03:30
Sample ID   : 86-S14-035             Date Analyzed: 01/15/05 03:30
Lab Samp ID : A070-02                 Dilution Factor: 1
Lab File ID : RAQ308                 Matrix          : WATER
Ext Btch ID : V005A26                % Moisture       : NA
Calib. Ref. : RAQ042                 Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	107	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

2/15/08

2005

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 11:19
Sample ID   : 86-S14-036             Date Analyzed: 01/15/05 11:19
Lab Samp ID : A070-03                Dilution Factor: 1
Lab File ID : RAQ321                 Matrix          : WATER
Ext Btch ID : V005A28                % Moisture      : NA
Calib. Ref. : RAQ042                 Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	104	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2/15/05

2006

SW 50308/B2608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 11:56
Sample ID   : 86-S14-037             Date Analyzed: 01/15/05 11:56
Lab Samp ID : A070-04                 Dilution Factor: 1
Lab File ID : RAQ322                 Matrix          : WATER
Ext Btch ID : V005A28                % Moisture       : NA
Calib. Ref. : RAQ042                 Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	110E J	1	.2
TOLUENE	4.7	1	.2
ETHYLBENZENE	.46J	1	.2
XYLENES (TOTAL)	10	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	109	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2010

2/15/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/18/05 19:32
Sample ID   : 86-S14-037DL           Date Analyzed: 01/18/05 19:32
Lab Samp ID : A070-04T                Dilution Factor: 10
Lab File ID : RAQ343                  Matrix          : WATER
Ext Btch ID : V005A29                 % Moisture       : NA
Calib. Ref. : RAQ042                  Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	130	10	2
TOLUENE	5.3J	10	2
ETHYLBENZENE	ND	10	2
XYLENES (TOTAL)	12J	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	111	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2/15/05 2011

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/20/05 13:35
Sample ID: 86-S14-038                Date Analyzed: 01/20/05 13:35
Lab Samp ID: A070-05                 Dilution Factor: 1
Lab File ID: RAQ401                  Matrix       : WATER
Ext Btch ID: V005A35                 % Moisture    : NA
Calib. Ref.: RAQ042                  Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	160E J	1	.2
TOLUENE	35	1	.2
ETHYLBENZENE	24	1	.2
XYLENES (TOTAL)	110E J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	125	65-135
BROMOFLUOROBENZENE	113	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

2/15/05 2012

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/20/05 14:14
Sample ID    : 86-S14-038DL           Date Analyzed: 01/20/05 14:14
Lab Samp ID  : A070-05T               Dilution Factor: 10
Lab File ID  : RAQ0402                Matrix          : WATER
Ext Btch ID  : V005A35                % Moisture       : NA
Calib. Ref.  : RAQ042                 Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	750E J	10	2
TOLUENE	37	10	2
ETHYLBENZENE	25	10	2
XYLENES (TOTAL)	120	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2/15/05 . 2013

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 01/10/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.    : 05A070                 Date Extracted: 01/22/05 11:56
Sample ID    : 86-S14-038DL           Date Analyzed: 01/22/05 11:56
Lab Samp ID  : A070-051               Dilution Factor: 2000
Lab File ID  : RAQ0472                 Matrix          : WATER
Ext Btch ID  : V005A41                 % Moisture       : NA
Calib. Ref.  : RAQ042                  Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	9800	2000	400
TOLUENE	ND	2000	400
ETHYLBENZENE	ND	2000	400
XYLENES (TOTAL)	ND	6000	1000
MTBE	ND	2000	400

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	107	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

Handwritten signature

2014

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/10/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/18/05 20:10
Sample ID   : 86-S14-039             Date Analyzed: 01/18/05 20:10
Lab Samp ID : A070-06R               Dilution Factor: 1
Lab File ID : RAQ344                 Matrix      : WATER
Ext Btch ID : V005A29                % Moisture   : NA
Calib. Ref. : RAQ042                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	108	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2/15/05 2013

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/18/05 20:47
Sample ID   : 86-S14-040             Date Analyzed: 01/18/05 20:47
Lab Samp ID : A070-07R               Dilution Factor: 1
Lab File ID : RAQ345                 Matrix          : WATER
Ext Btch ID : V005A29                % Moisture      : NA
Calib. Ref. : RAQ042                 Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
BROMOFLUOROBENZENE	104	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

2/15/05

2016

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO B6 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 13:09
Sample ID   : 86-S14-041             Date Analyzed: 01/15/05 13:09
Lab Samp ID : A070-08                 Dilution Factor: 1
Lab File ID : RA0324                 Matrix          : WATER
Ext Btch ID : V005A28                % Moisture       : NA
Calib. Ref. : RA0042                 Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	110	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

2/15/05

2017

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 01/11/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/12/05
Batch No.   : 05A070                 Date Extracted: 01/15/05 13:46
Sample ID   : 86-S14-042             Date Analyzed: 01/15/05 13:46
Lab Samp ID : A070-09                 Dilution Factor: 1
Lab File ID : RAQ325                 Matrix       : WATER
Ext Btch ID : V005A28                % Moisture   : NA
Calib. Ref. : RAQ042                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	105	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2/15/05

2018

LDC #: 13124A1

VALIDATION COMPLETENESS WORKSHEET

Date: 2/11/05

SDG #: 05A070

Level III/IV

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: JVC

2nd Reviewer: A

METHOD: GC/MS Volatiles (BTEX & MTBE)(EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/10 - 11/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	no SPC RRF
IV.	Continuing calibration	A	CCV / ICV $\leq 20\%$ ↓
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 2, 3
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1	86-S14-033	TB	11	2	86-S14-041	21	1	MBLK1W	31	
2	1	86-S14-035		12	2	86-S14-042	22	2	MBLK2W	32	
3	2	86-S14-036**		13	3	86-S14-039MS	23	3	MBLK3W	33	
4	2	86-S14-037		14	3	86-S14-039MSD	24	4	MBLK4W	34	
5	3	86-S14-037DL		15			25	5	MBLK5W	35	
6	4	86-S14-038		16			26			36	
7	4	86-S14-038DL1		17			27			37	
8	5	86-S14-038DL2		18			28			38	
9	3	86-S14-039		19			29			39	
10	3	86-S14-040		20			30			40	

LDC #: 12/24 A1
SDG #: 05 A070

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: JTC
2nd Reviewer: [Signature]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were all percent relative standard deviations (%RSD) \leq 30% and relative response factors (RRF) \geq 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) \leq 25% and relative response factors (RRF) \geq 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 13/24 A1
SDG #: 05 A070

VALIDATION FINDINGS CHECKLIST

Page: 2 of 3
Reviewer: JG
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within \pm 30 seconds of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within \pm 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within \pm 20% between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

DC #: 13124A1
SDG #: 05A070

VALIDATION FINDINGS CHECKLIST

Page: 3 of 3
Reviewer: JN
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	S. Trichloroethane	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl chloride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Methyl ethyl ketone	FFF. 1,3-Dichlorobenzene	XXX. Di-Isopropyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethane	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCC. 1-Chlorohexane
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFF. Acrolein
M. 2-Butanol	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethane	HHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethane	III. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJ. Methacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethyvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLL.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET

Page: _____ of _____
 Reviewer: JVZ
 2nd Reviewer: X

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".			
Y	N	N/A	Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?
Y	N	N/A	Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

[illegible]

Comments: See sample calculation verification worksheet for recalculations

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

LDC #: 13124A1
 SDG #: 05A070

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_s)(C_u)/(A_u)(C_s)$
 average RRF = sum of the RRFs/number of standards
 $\%RSD = 100 * (S/X)$
 A_s = Area of compound,
 C_s = Concentration of compound,
 S = Standard deviation of the RRFs
 X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				RRF (10 std)	RRF (10 std)	RRF (10 std)	RRF (10 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	1CAL	1/05/05	Methylene chloride (1st internal standard)	0.437	0.437	0.437	0.437	0.427	0.427	4.54	4.52
			Trichloroethene (2nd internal standard)	1.740	1.740	1.740	1.740	1.700	1.700	2.24	2.24
			Toluene (3rd internal standard)								
2			Methylene chloride (1st internal standard)								
			Trichloroethene (2nd internal standard)								
			Toluene (3rd internal standard)								
3			Methylene chloride (1st internal standard)								
			Trichloroethene (2nd internal standard)								
			Toluene (3rd internal standard)								
4			Methylene chloride (1st internal standard)								
			Trichloroethene (2nd internal standard)								
			Toluene (3rd internal standard)								

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [Signature]

LDC #: 13124 A1
SDG #: 05A070

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
 A_x = Area of compound, A_{is} = Area of associated internal standard
 C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	RAQ 314	1/15/05	MTBE Methylene chloride (1st internal standard)	0.427	0.419	1.9	0.419	1.8
			Benzene Trichloroethene (2nd internal standard)	1.700	1.761	3.6	1.761	3.6
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13124A1
SDG #: 05A670

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVC
2nd reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 3

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	10.43	104	104	6
Bromofluorobenzene		10.47	105	105	
1,2-Dichloroethane-d4		10.39	104	104	
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Recovery} = 100 \cdot \frac{\text{SSC/SA}}{\text{SSC/SA}}$$

Where: SSC = Spiked sample concentration
SA = Spike added

$$RPD = |LCS - LCSD| * 2 / (LCS + LCSD)$$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: V005A 28L/C

[illegible]

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13124 A1
SDG #: 05 A 070

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1
Reviewer: JVC
2nd reviewer: A

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)
 All reported results recalculated as

MS VOA (EPA SW 846 Method 8260B)
Were all reported results recalculated and verified for all level IV samples?
Do the results for detected target compounds agree within

MS VOA (EPA SW 846 Method 8260),
 Were all reported results recalculated and verified for all level IV samples?
 Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Y	N	N/A
Y	N	N/A

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_s)(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. # 3, ND

$$\text{Conc.} = \frac{(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)}$$
[illegible]



TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 10382

CHAIN-OF-CUSTODY RECORD

PROJECT NAME UST Shell		PURCHASE ORDER NO. 20818 Task 33		ANALYSES REQUIRED										LABORATORY NAME EMAX		Project Information Section Do not submit to Laboratory					
PROJECT LOCATION MOULTON FIELD, CA		PROJECT NO. 1990.086E												LABORATORY ID (FOR LABORATORY) 05D146							
SAMPLER NAME PETER GRAZIANO		AIRBILL NUMBER 850458375525																			
PROJECT CONTACT LYNN JEFFERSON		PROJECT CONTACT PHONE NUMBER 919.736.7558																			
SAMPLE ID SW 86-E-019		DATE COLLECTED 4/20/05		TIME COLLECTED 1500		NO OF CONTAINER 6		LEVEL 3 4		T P E		T A T		COMMENTS		LOCATION W14-3		DEPTH START END		QC	
86-E-013		4/20/05		1200		6		X		W DAY		10 DAY				Tnp Blank		/		Reg.	
86-E-052		4/20/05		1535		6		X		W DAY		10 DAY						/		TB	
86-E-018		4/20/05		1605		6		X		W DAY		10 DAY						/		Reg.	
86-E-016		4/21/05		0830		6		X		W DAY		10 DAY						/		Reg.	
86-E-017		4/21/05		0835		6		X		W DAY		10 DAY						/		Reg.	
86-E-050		4/21/05		0905		6		X		W DAY		10 DAY						/		Reg.	
86-E-051		4/21/05		0945		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
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86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY						/		Reg.	
86-E-045		4/21/05		1010		6		X		W DAY		10 DAY									

CASE NARRATIVE

CLIENT: TETRA TECH FW, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05D146

**SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS**

Nine (9) water samples were received on 04/22/05 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met. Please see section 7 for details.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blank was free of contamination at the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Sample D146-04 was analyzed less than 2 hours out of holding time, but the results were supported by initial analysis at 5ml calibration and was within holding time. Result of this analysis was submitted as supplementary data.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS

Client : TETRA TECH FW, INC
Project : UST SITE 14, MFA, CTO 86

SDG NO. : 050146
Instrument ID : 1-005

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLKTW	V005E100	1	NA	05/04/0517:22	05/04/0517:22	REQ088	R00398	V005E10	Method Blank
LCS1W	V005E101	1	NA	05/04/0515:19	05/04/0515:19	REQ085	R00398	V005E10	Lab Control Sample (LCS)
LCD1W	V005E10C	1	NA	05/04/0515:56	05/04/0515:56	REQ086	R00398	V005E10	LCS Duplicate
86-S14-048DL	D146-04T	100	NA	05/04/0518:00	05/04/0518:00	REQ089	R00398	V005E10	Diluted Sample
86-S14-049	D146-01N	1	NA	05/04/0518:37	05/04/0518:37	REQ090	R00398	V005E10	Field Sample
86-S14-043	D146-02N	1	NA	05/04/0519:13	05/04/0519:13	REQ091	R00398	V005E10	Field Sample
86-S14-052	D146-03N	1	NA	05/04/0520:28	05/04/0520:28	REQ093	R00398	V005E10	Field Sample
86-S14-050	D146-07R	1	NA	05/04/0521:05	05/04/0521:05	REQ094	R00398	V005E10	Field Sample
86-S14-045	D146-09R	1	NA	05/04/0521:43	05/04/0521:43	REQ095	R00398	V005E10	Field Sample
86-S14-047	D146-06R	1	NA	05/04/0522:20	05/04/0522:20	REQ096	R00398	V005E10	Field Sample
86-S14-051	D146-08R	1	NA	05/04/0522:57	05/04/0522:57	REQ097	R00398	V005E10	Field Sample
86-S14-046DL	D146-05T	5	NA	05/04/0523:35	05/04/0523:35	REQ098	R00398	V005E10	Diluted Sample
86-S14-046	D146-05R	1	NA	05/05/0500:50	05/05/0500:50	REQ100	R00398	V005E10	Field Sample
86-S14-048	D146-04N	5	NA	05/05/0501:27	05/05/0501:27	REQ101	R00398	V005E10	Field Sample

FW - Filename
% Moist - Percent Moisture

2002

SAMPLE RESULTS

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86      Date Received: 04/22/05
Batch No.    : 050146                       Date Extracted: 05/04/05 18:37
Sample ID    : 86-S14-049                   Date Analyzed: 05/04/05 18:37
Lab Samp ID  : D146-01N                     Dilution Factor: 1
Lab File ID  : REQ090                       Matrix          : WATER
Ext Btch ID  : V005E10                      % Moisture      : NA
Calib. Ref.  : RDQ398                       Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC          Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 04/22/05
Batch No.   : 05D146                     Date Extracted: 05/04/05 19:13
Sample ID: 86-S14-043                     Date Analyzed: 05/04/05 19:13
Lab Samp ID: D146-02N                     Dilution Factor: 1
Lab File ID: REQ091                        Matrix       : WATER
Ext Btch ID: V005E10                       % Moisture    : NA
Calib. Ref.: RDQ398                       Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	98	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MPA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                      Date Extracted: 05/04/05 20:28
Sample ID    : 86-S14-052                  Date Analyzed: 05/04/05 20:28
Lab Samp ID  : D146-03N                    Dilution Factor: 1
Lab File ID  : REQ093                      Matrix       : WATER
Ext Btch ID  : V005E10                     % Moisture   : NA
Calib. Ref.  : RDQ398                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	102	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC           Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO B6     Date Received: 04/22/05
Batch No.   : 05D146                      Date Extracted: 05/05/05 01:27
Sample ID: 86-S14-048                     Date Analyzed: 05/05/05 01:27
Lab Samp ID: D146-04N                     Dilution Factor: 5
Lab File ID: REQ101                       Matrix          : WATER
Ext Btch ID: V005E10                      % Moisture       : NA
Calib. Ref.: RDQ398                      Instrument ID    : T-005
=====

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PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	330E	5	1
TOLUENE	3.5J	5	1
ETHYLBENZENE	1.9J	5	1
XYLENES (TOTAL)	25	15	2.5
MTBE	ND	5	1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	97	75-125

RL: Reporting Limit

SW 50308/62608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.    : 05D146                 Date Extracted: 05/04/05 18:00
Sample ID    : 86-S14-0480L           Date Analyzed: 05/04/05 18:00
Lab Samp ID  : D146-04T                Dilution Factor: 100
Lab File ID  : REQ089                  Matrix       : WATER
Ext Btch ID  : V005E10                 % Moisture    : NA
Calib. Ref.  : RDQ398                  Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	2100	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MPA, CTO 86      Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 05/05/05 00:50
Sample ID    : 86-S14-046                   Date Analyzed: 05/05/05 00:50
Lab Samp ID  : D146-05R                     Dilution Factor: 1
Lab File ID  : REQ100                       Matrix          : WATER
Ext Btch ID  : V005E10                      % Moisture      : NA
Calib. Ref.  : RDQ39B                      Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	42E	1	.2
TOLUENE	1.5	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	1.5J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTD 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 05/04/05 23:35
Sample ID    : 86-S14-046DL                 Date Analyzed: 05/04/05 23:35
Lab Samp ID  : D146-05T                     Dilution Factor: 5
Lab File ID  : REQ098                       Matrix          : WATER
Ext Btch ID  : V005E10                      % Moisture      : NA
Calib. Ref.  : RDQ398                       Instrument ID   : I-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	46	5	1
TOLUENE	1.5J	5	1
ETHYLBENZENE	ND	5	1
XYLENES (TOTAL)	ND	15	2.5
MTBE	ND	5	1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	97	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : GST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                      Date Extracted: 05/04/05 22:20
Sample ID:   B6-S14-047                   Date Analyzed: 05/04/05 22:20
Lab Samp ID: D146-06R                     Dilution Factor: 1
Lab File ID: REQ096                       Matrix       : WATER
Ext Btch ID: V005E10                      % Moisture    : NA
Calib. Ref.: RDQ398                      Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	38	1	.2
TOLUENE	1.3	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	1.4J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

Quantitation Report (QT Reviewed)

Data File : D:\HPCHEM\1\DATA\05E04\REQ096.D

Vial: 15

Acq On : 4 May 2005 10:20 pm

Operator: DN

Sample : 05D146-06R 25mL

Inst : TO05

Misc : DF=1.0

Multiplr: 1.00

MS Integration Params: 524TAIL.P

Quant Time: May 5 11:27 2005

Quant Results File: VO05D21.RES

Quant Method : D:\HPCHEM\1\METHODS\VO05D21.M (RTE Integrator)

Title : METHOD 8260

Last Update : Thu Apr 21 18:12:10 2005

Response via : Initial Calibration

DataAcq Meth : VO05D21

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	8.63	114	1455240	10.00	ug/l	0.00
37) CHLOROBENZENE-D5	14.54	117	1156683	10.00	ug/l	0.00
68) 1,2-DICHLOROBENZENE-D4	20.84	152	391711	10.00	ug/l	0.00

System Monitoring Compounds

36) 1,2-Dichloroethane-d4	7.92	65	321218	10.35	ug/l	0.00
Spiked Amount	10.000		Recovery	=	103.50%	
50) Toluene-d8	11.44	98	1579391	9.90	ug/l	0.00
Spiked Amount	10.000		Recovery	=	99.00%	
72) 4-Bromofluorobenzene	17.27	95	476681	9.59	ug/l	0.00
Spiked Amount	10.000		Recovery	=	95.90%	

Target Compounds

						Qvalue
11) Acetone	3.71	43	110692	21.80	ug/l	84
13) tert-Butyl alcohol	4.01	59	18985	15.92	ug/l	92
23) 1,1-Dichloroethane	5.56	63	18142	0.22	ug/l	88
34) Cyclohexane	7.40	56	4474956	49.03	ug/l	91
41) Benzene	8.10	78	7946970	38.18	ug/l	100
51) Toluene	11.59	92	161240	1.31	ug/l	97
64) Ethylbenzene	14.79	91	36180	0.17	ug/l	99
65) m-Xylene & p-Xylene	14.95	91	217659	1.28	ug/l	97
66) o-Xylene	15.89	91	18368	0.12	ug/l	95
70) Isopropylbenzene	16.74	105	549602	2.60	ug/l	100
75) n-Propylbenzene	17.65	91	327697	1.24	ug/l	99

2012

 (#) = qualifier out of range (m) = manual integration
 REQ096.D VO05D21.M Thu May 05 11:27:45 2005

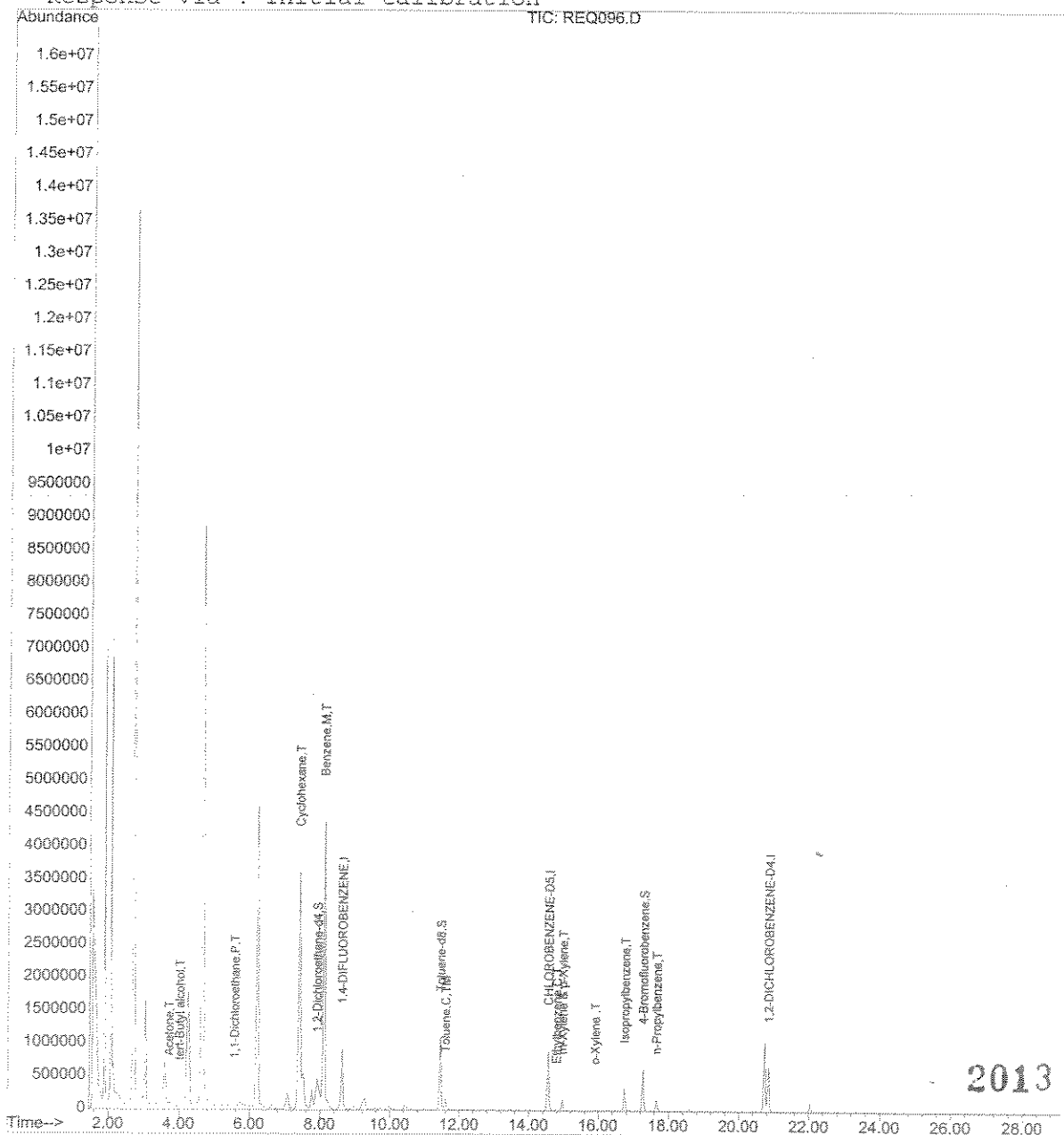
Quantitation Report

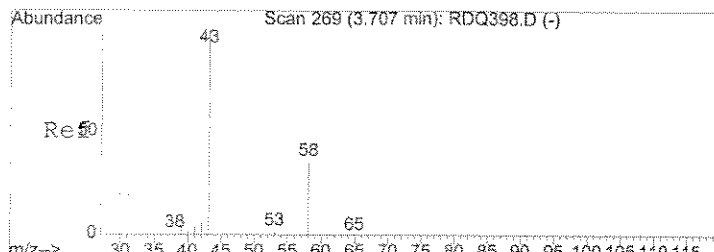
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Acq On : 4 May 2005 10:20 pm
Sample : 05D146-06R 25mL
Misc : DF=1.0
MS Integration Params: 524TAIL.P
Quant Time: May 5 11:27 2005

Vial: 15
Operator: DN
Inst : TO05
Multiplr: 1.00

Quant Results File: VO05D21.RES

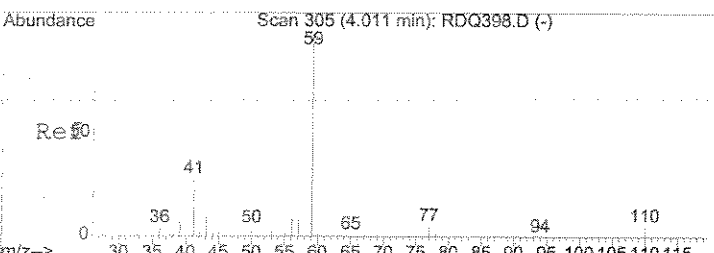
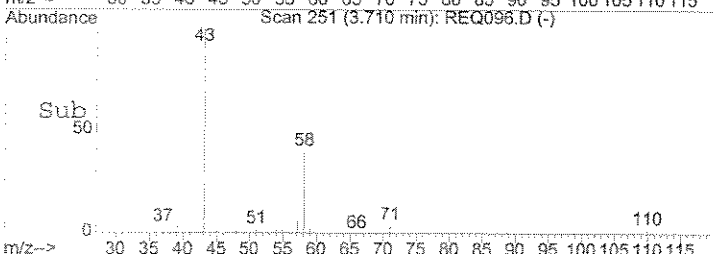
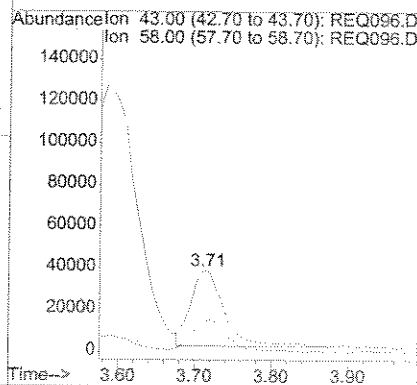
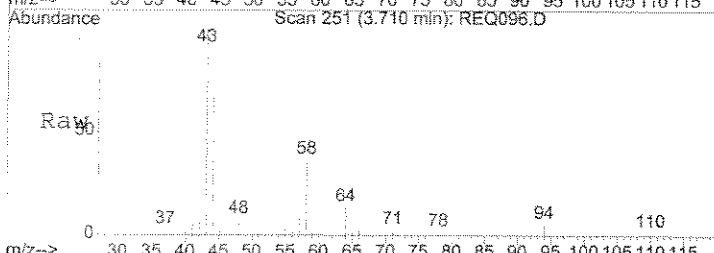
Method : D:\HPCHEM\1\METHODS\VO05D21.M (RTE Integrator)
Title : METHOD 8260
Last Update : Thu Apr 21 18:12:10 2005
Response via : Initial Calibration





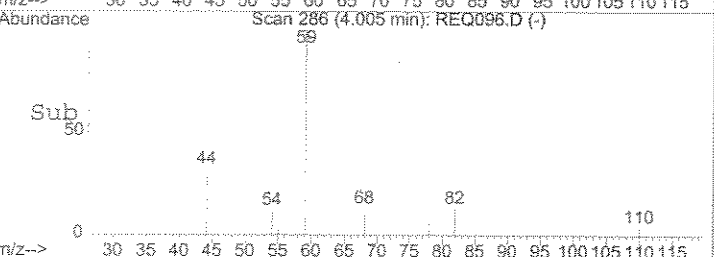
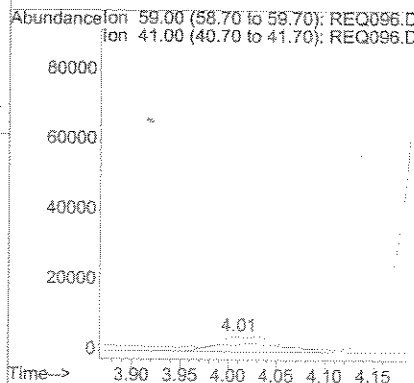
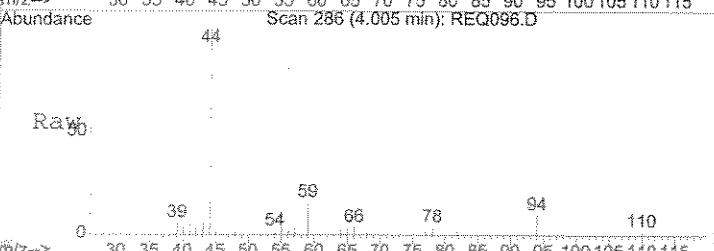
#11
Acetone
Concen: 21.80 ug/l
RT: 3.71 min Scan# 251
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 43 Resp: 110692
Ion Ratio Lower Upper
43 100
58 45.9 6.3 66.3

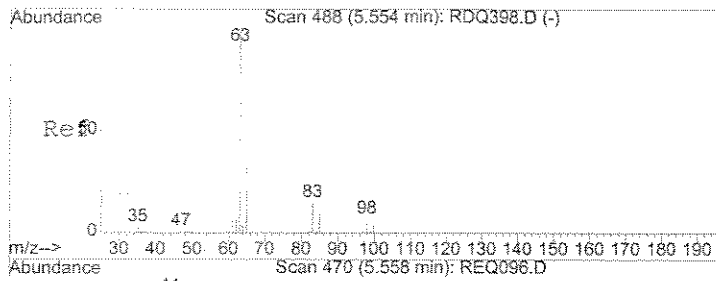


#13
tert-Butyl alcohol
Concen: 15.92 ug/l
RT: 4.01 min Scan# 286
Delta R.T. -0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 59 Resp: 18985
Ion Ratio Lower Upper
59 100
41 39.4 4.7 64.7

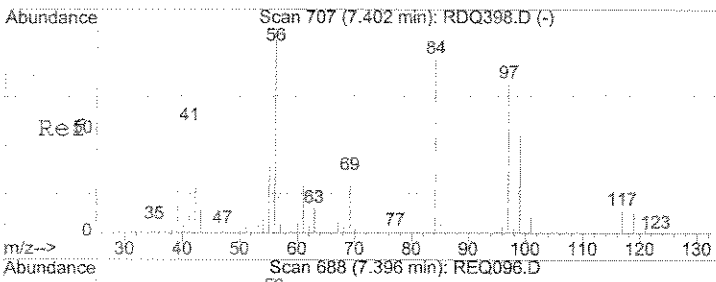
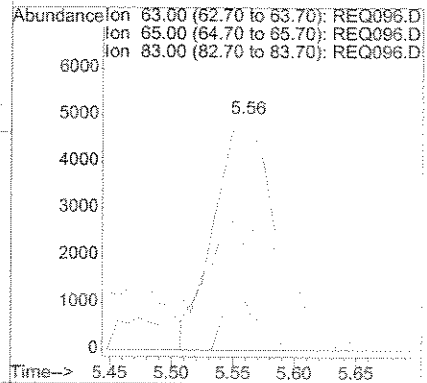
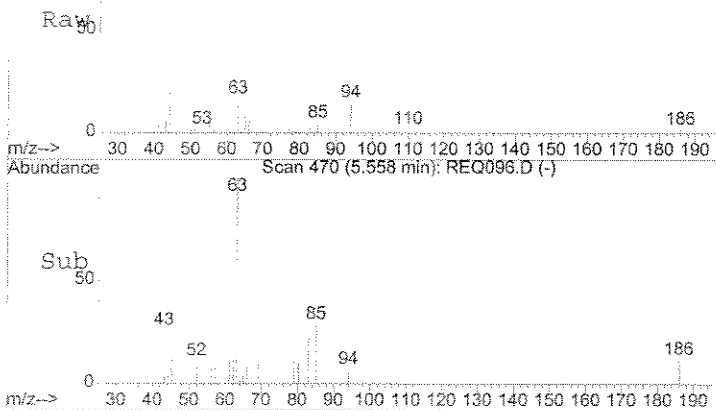


2014



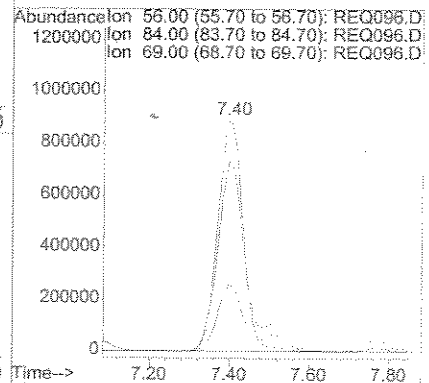
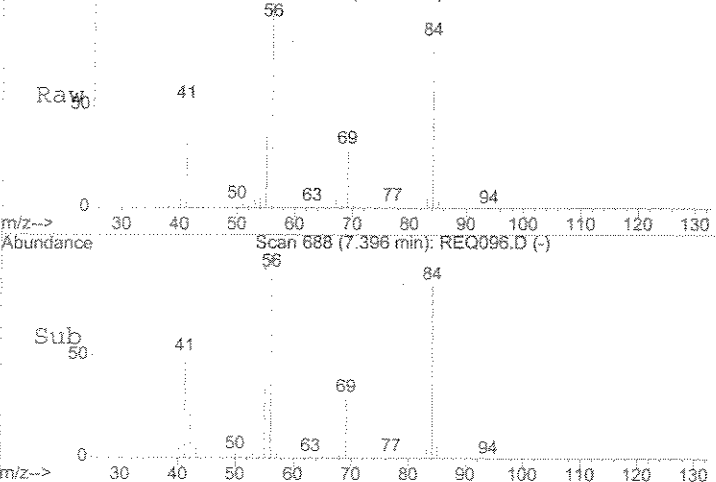
#23
1,1-Dichloroethane
Concen: 0.22 ug/l
RT: 5.56 min Scan# 470
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion	Ratio	Lower	Upper
63	100		
65	41.5	3.0	63.0
83	12.8	0.0	44.1

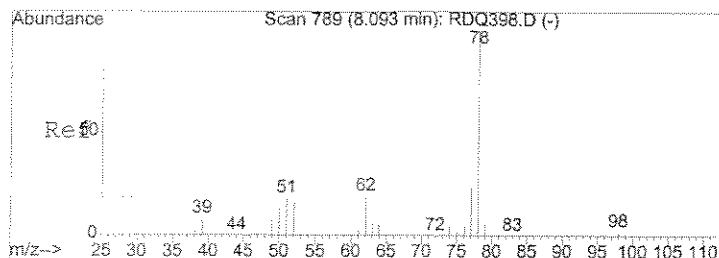


#34
Cyclohexane
Concen: 49.03 ug/l
RT: 7.40 min Scan# 688
Delta R.T. -0.01 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion	Ratio	Lower	Upper
56	100		
84	74.3	53.2	113.2
69	32.7	0.0	58.4

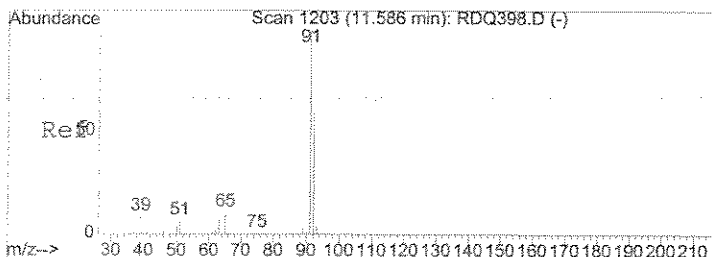
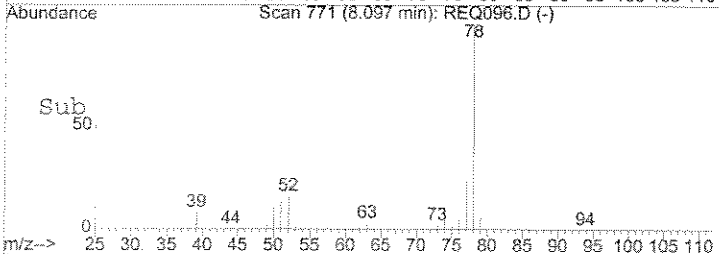
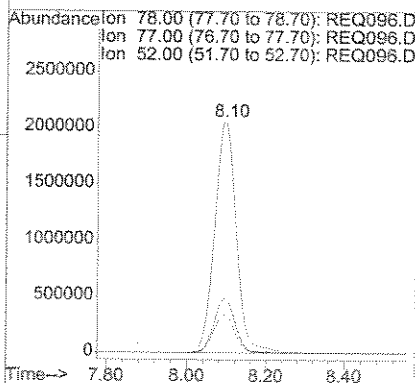
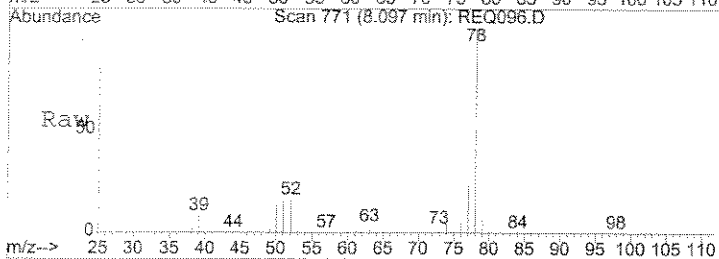


2015



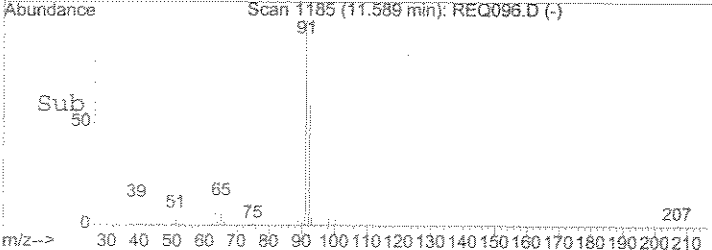
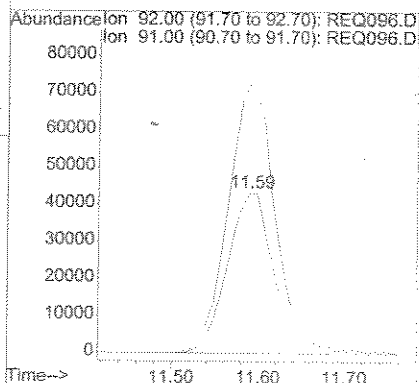
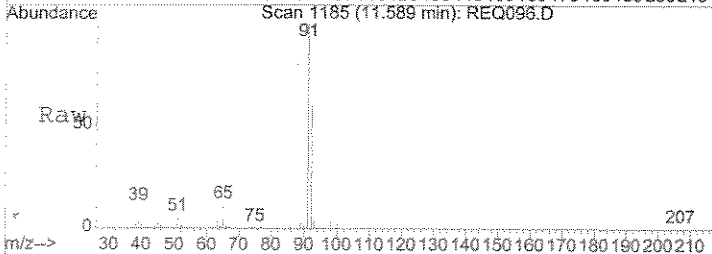
#41
Benzene
Concen: 38.18 ug/l
RT: 8.10 min Scan# 771
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion:	78	Resp:	7946970
Ion	Ratio	Lower	Upper
78	100		
77	23.5	0.0	53.8
52	16.4	0.0	46.4

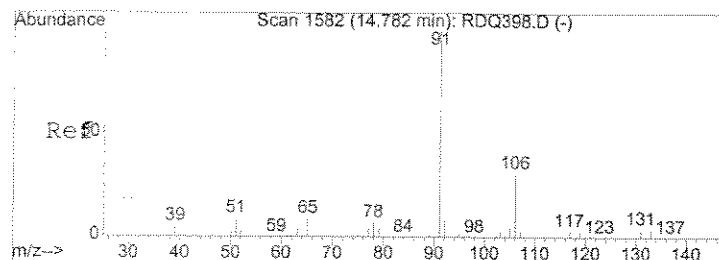


#51
Toluene
Concen: 1.31 ug/l
RT: 11.59 min Scan# 1185
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion:	92	Resp:	161240
Ion	Ratio	Lower	Upper
92	100		
91	171.7	137.0	197.0

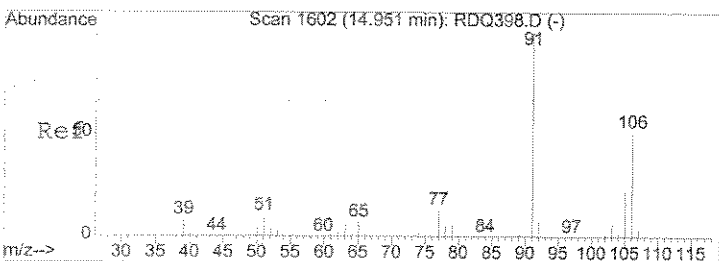
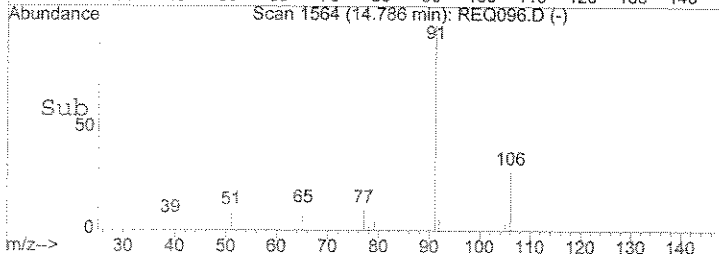
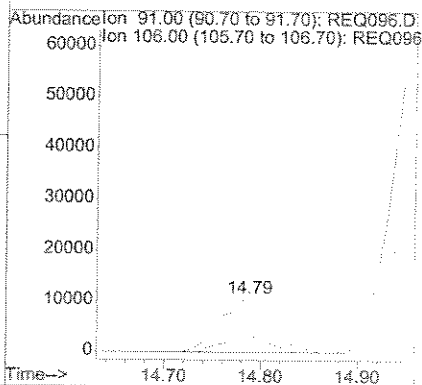
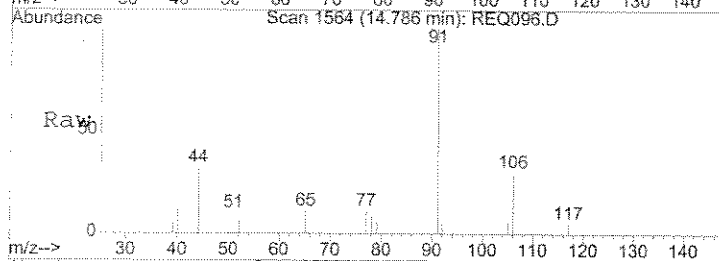


2016



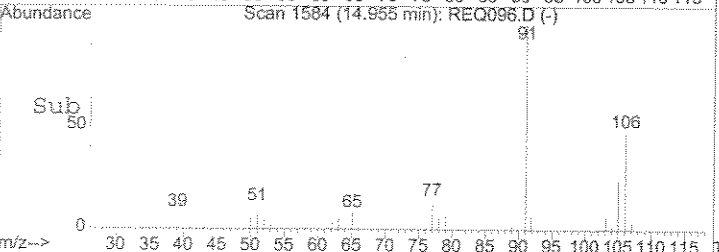
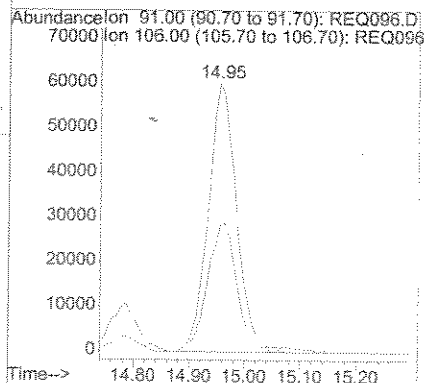
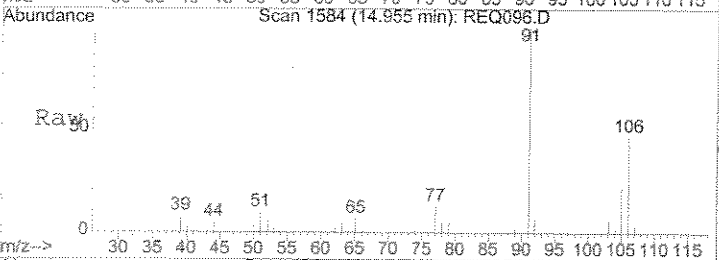
#64
Ethylbenzene
Concen: 0.17 ug/l
RT: 14.79 min Scan# 1564
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 91 Resp: 36180
Ion Ratio Lower Upper
91 100
106 30.1 0.5 60.5

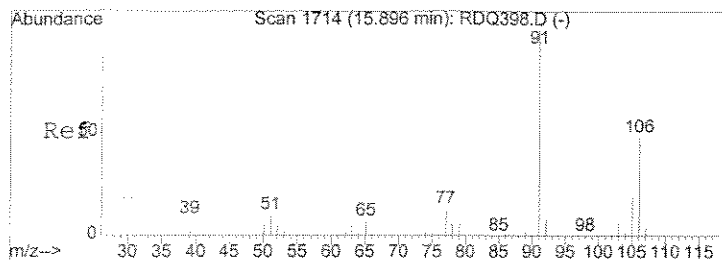


#65
m-Xylene & p-Xylene
Concen: 1.28 ug/l
RT: 14.95 min Scan# 1584
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 91 Resp: 217659
Ion Ratio Lower Upper
91 100
106 48.9 21.1 81.1

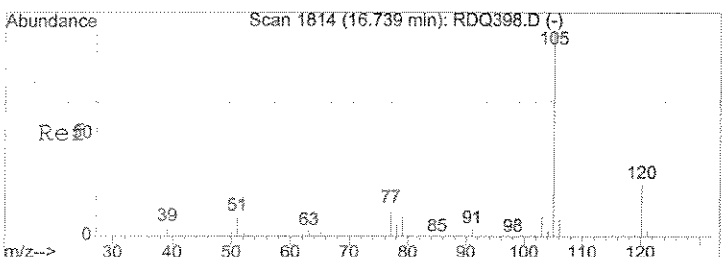
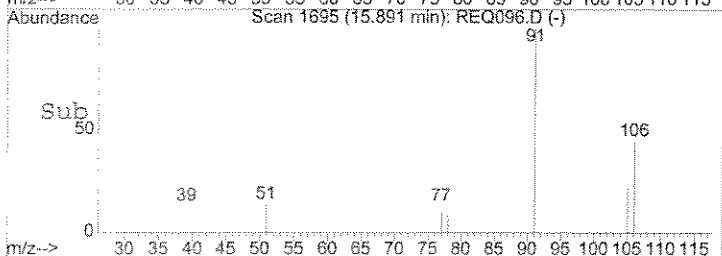
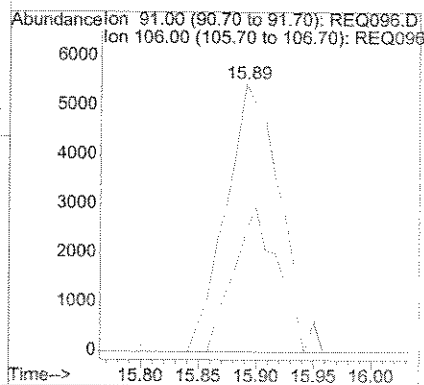
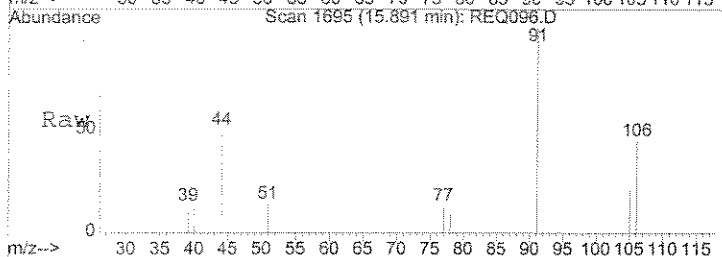


2017



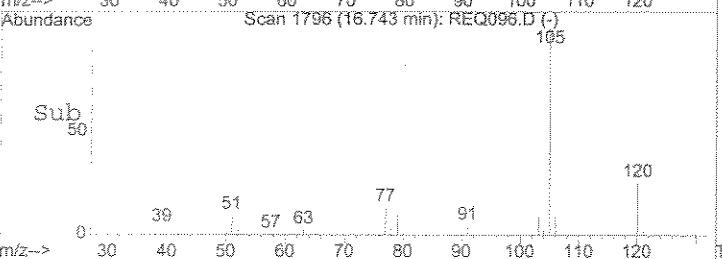
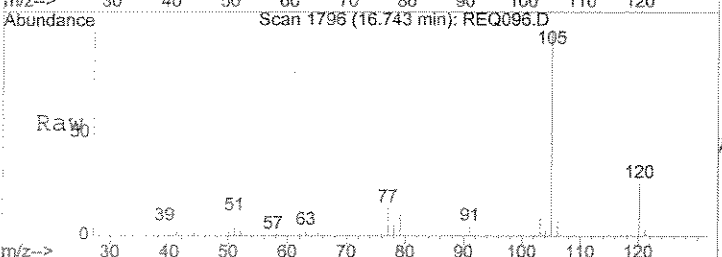
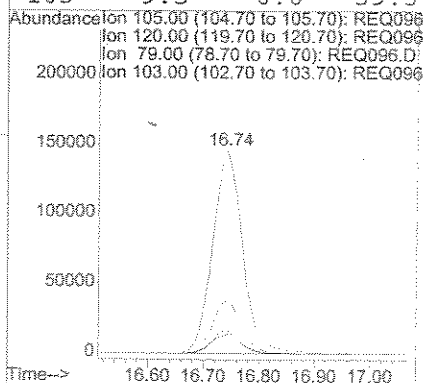
#66
o-Xylene
Concen: 0.12 ug/l
RT: 15.89 min Scan# 1695
Delta R.T. -0.01 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 91 Resp: 18368
Ion Ratio Lower Upper
91 100
106 45.0 18.3 78.3

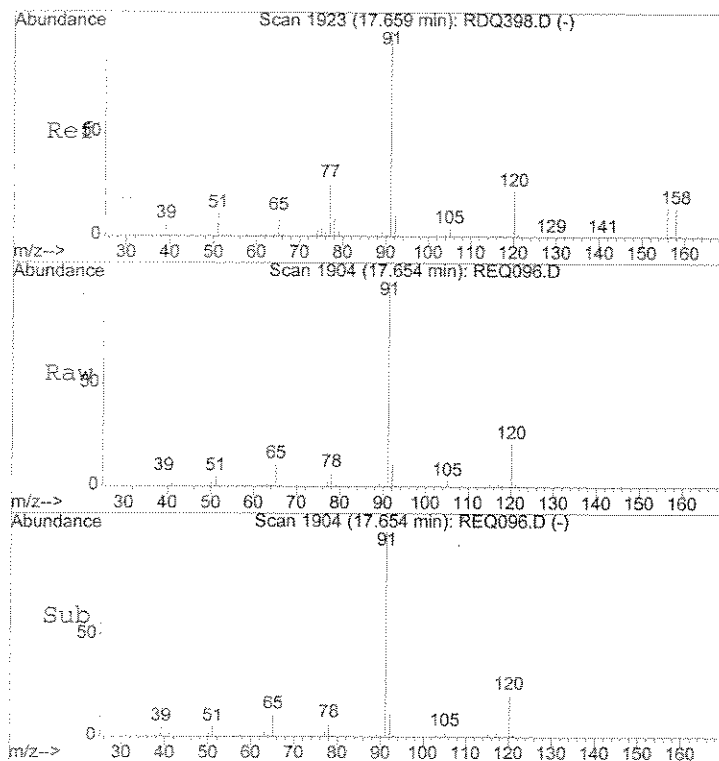


#70
Isopropylbenzene
Concen: 2.60 ug/l
RT: 16.74 min Scan# 1796
Delta R.T. 0.00 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion: 105 Resp: 549602
Ion Ratio Lower Upper
105 100
120 25.9 0.0 56.0
79 11.2 0.0 41.5
103 9.5 0.0 39.3

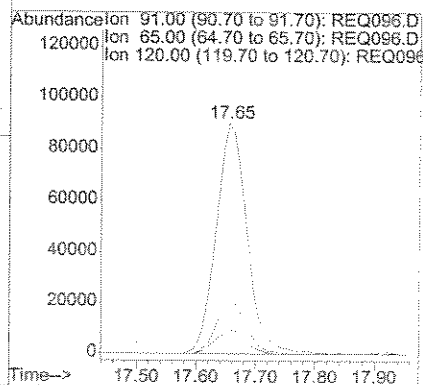


2018



#75
n-Propylbenzene
Concen: 1.24 ug/l
RT: 17.65 min Scan# 1904
Delta R.T. -0.01 min
Lab File: REQ096.D
Acq: 4 May 2005 10:20 pm

Tgt Ion	Ratio	Lower	Upper
91	100		
65	10.3	0.0	39.7
120	21.6	0.0	51.7



2019

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/04/05 21:05
Sample ID   : 86-S14-050             Date Analyzed: 05/04/05 21:05
Lab Samp ID : D146-07R               Dilution Factor: 1
Lab File ID : REQ094                 Matrix       : WATER
Ext Btch ID : V005E10                % Moisture   : NA
Calib. Ref. : RD0398                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	98	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                      Date Extracted: 05/04/05 22:57
Sample ID:   86-S14-051                    Date Analyzed: 05/04/05 22:57
Lab Samp ID: D146-08R                      Dilution Factor: 1
Lab File ID: REQ097                        Matrix       : WATER
Ext Btch ID: V005E10                      % Moisture    : NA
Calib. Ref.: RDQ398                      Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```
=====
Client       : TETRA TECH FW, INC      Date Collected: 04/21/05
Project      : UST SITE 14, MPA, CTO 86 Date Received: 04/22/05
Batch No.    : 050146                 Date Extracted: 05/04/05 21:43
Sample ID:   86-S14-045                Date Analyzed: 05/04/05 21:43
Lab Samp ID: D146-09R                  Dilution Factor: 1
Lab File ID: REQ095                    Matrix       : WATER
Ext Btch ID: V005E10                  % Moisture    : NA
Calib. Ref.: RDQ398                   Instrument ID : T-005
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

CASE NARRATIVE

CLIENT: TETRA TECH FW, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05D146

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Nine (9) water samples were received on 04/22/05 for Total Petroleum Hydrocarbons by Purge and Trap analysis by Method 5030B/M8015 in accordance with SW846 3rd Edition.

1. Holding Time

Analytical holding time was met. Water samples were preserved.

2. Calibration

Initial calibration was seven points. %RSD was within 20%. Continuing calibrations were carried out at 12-hour intervals and at the end of the analysis sequence. All recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at the reporting limit.

4. Surrogate Recovery

Surrogate recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Results were quantified from C₆ to C₁₀ using GRO (C₆ - C₁₀) calibration factor.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : TETRA TECH FM, INC
Project : UST SITE 14, MFA, CTO 86
SDG NO. : 050146
Instrument ID : GCT039

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
MBLK1W	VA39013B	1	NA	04/26/0516:56			04/26/0516:56	ED26003A	ED26002A	VA39013	Method Blank
LCS1W	VA39013L	1	NA	04/26/0517:32			04/26/0517:32	ED26004A	ED26002A	VA39013	Lab Control Sample (LCS)
LCD1W	VA39013C	1	NA	04/26/0518:08			04/26/0518:08	ED26005A	ED26002A	VA39013	LCS Duplicate
86-S14-049	D146-01	1	NA	04/26/0518:44			04/26/0518:44	ED26006A	ED26002A	VA39013	Field Sample
86-S14-043	D146-02	1	NA	04/26/0519:19			04/26/0519:19	ED26007A	ED26002A	VA39013	Field Sample
86-S14-052	D146-03	1	NA	04/26/0519:55			04/26/0519:55	ED26008A	ED26002A	VA39013	Field Sample
86-S14-048	D146-04	1	NA	04/26/0520:31			04/26/0520:31	ED26009A	ED26002A	VA39013	Field Sample
86-S14-046	D146-05	1	NA	04/26/0521:06			04/26/0521:06	ED26010A	ED26002A	VA39013	Field Sample
86-S14-047	D146-06	1	NA	04/26/0521:42			04/26/0521:42	ED26011A	ED26002A	VA39013	Field Sample
86-S14-050	D146-07	1	NA	04/26/0522:17			04/26/0522:17	ED26012A	ED26002A	VA39013	Field Sample
86-S14-051	D146-08	1	NA	04/26/0523:29			04/26/0523:29	ED26014A	ED26013A	VA39013	Field Sample
86-S14-045	D146-09	1	NA	04/27/0500:05			04/27/0500:05	ED26015A	ED26013A	VA39013	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 06     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 18:44
Sample ID    : 86-S14-049                   Date Analyzed: 04/26/05 18:44
Lab Samp ID  : D146-01                      Dilution Factor: 1
Lab File ID  : ED26006A                     Matrix          : WATER
Ext Btch ID  : VA39D13                      % Moisture       : NA
Calib. Ref.  : ED26002A                     Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	89	65-135

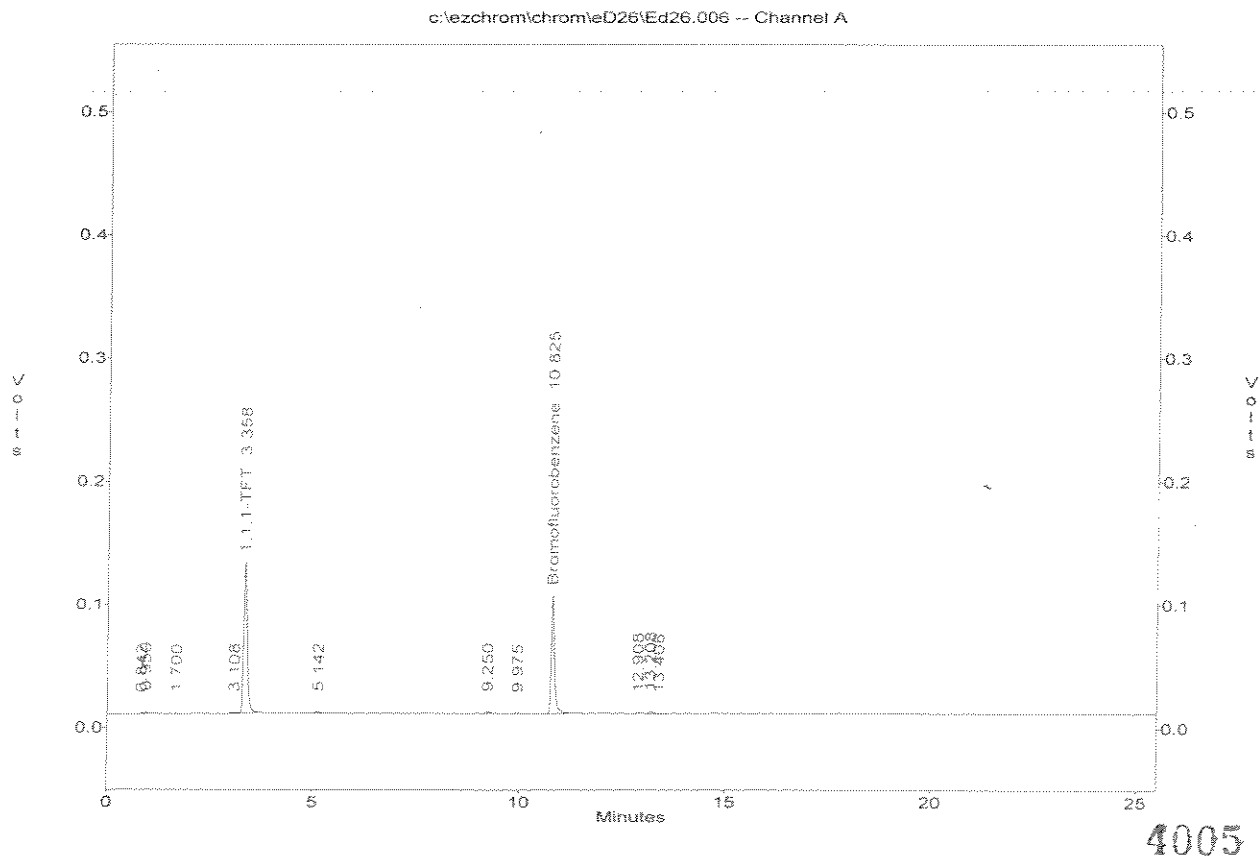
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.006
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-01 5.0ML W
Acquired : Apr 26, 2005 18:44:07
Printed : Apr 26, 2005 19:09:39
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
5	1,1,1-TFT	3.358	763725.0	23231.0	32.88
9	Bromofluorobenzene	10.825	561081.0	15791.7	35.53
G1	GASOLINE (TOTAL)		52487.0	15626.4	3.36
G2	GRO (C6-C10)		33598.0	13111.9	2.56
G3	GRO (2MP-124TMB)		33598.0	13114.6	2.56
G4	GRO (C5-C12)		52487.0	15510.5	3.38



METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 050146                 Date Extracted: 04/26/05 19:19
Sample ID   : 86-S14-043             Date Analyzed: 04/26/05 19:19
Lab Samp ID : D146-02                Dilution Factor: 1
Lab File ID : ED26007A               Matrix          : WATER
Ext Btch ID : VA39D13                % Moisture       : NA
Calib. Ref. : ED26002A               Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	88	65-135

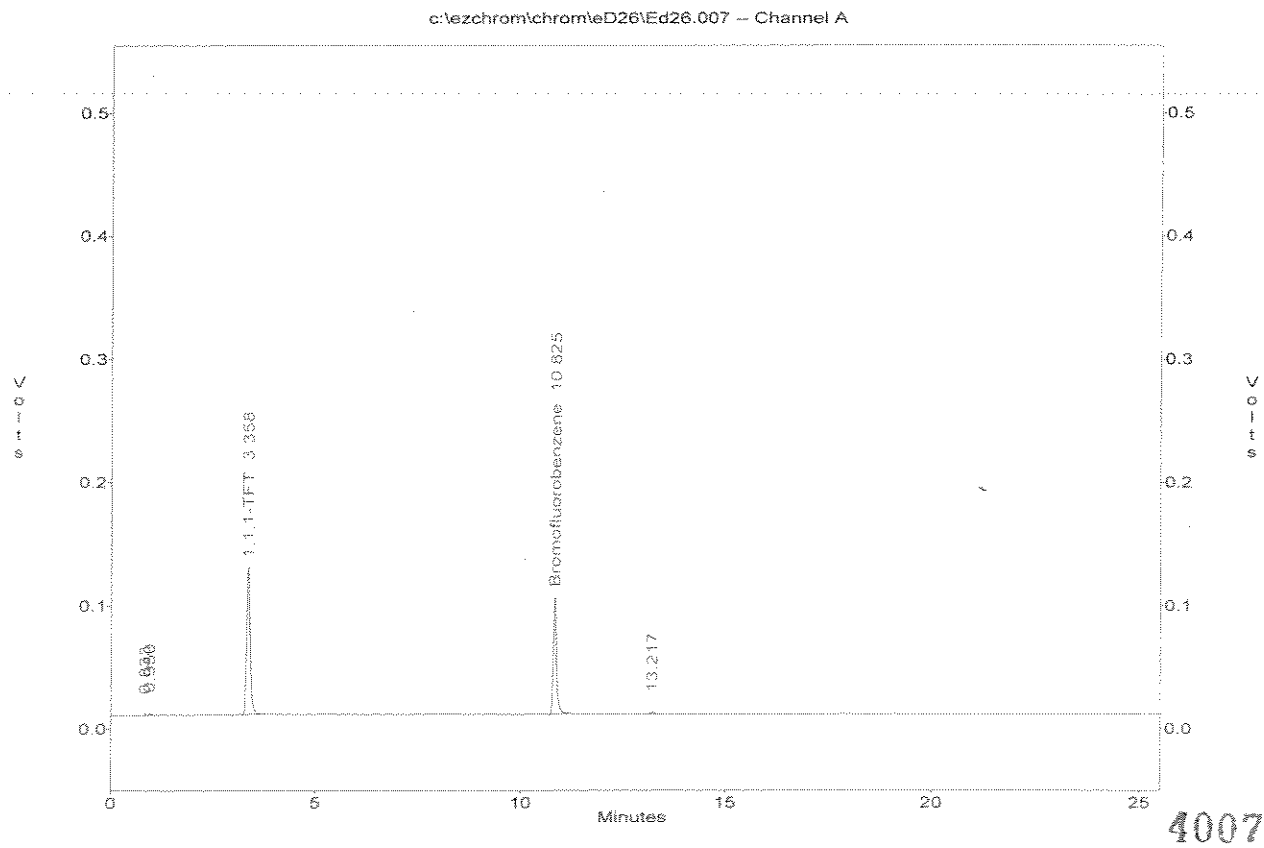
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.007
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-02 5.0ML W
Acquired : Apr 26, 2005 19:19:48
Printed : Apr 26, 2005 19:45:20
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
3	1,1,1-TFT	3.358	757376.0	23231.0	32.60
4	Bromofluorobenzene	10.825	553007.0	15791.7	35.02
G1	GASOLINE (TOTAL)		9948.0	15626.4	0.64
G2	GRO (C6-C10)		0.0	13111.9	0.00
G3	GRO (2MP-124TMB)		0.0	13114.6	0.00
G4	GRO (C5-C12)		9948.0	15510.5	0.64



METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                      Date Extracted: 04/26/05 19:55
Sample ID    : 86-S14-052                 Date Analyzed: 04/26/05 19:55
Lab Samp ID  : D146-03                    Dilution Factor: 1
Lab File ID  : ED26008A                   Matrix       : WATER
Ext Btch ID  : VA39013                     % Moisture    : NA
Calib. Ref.  : ED26002A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	65-135

RL : Reporting Limit

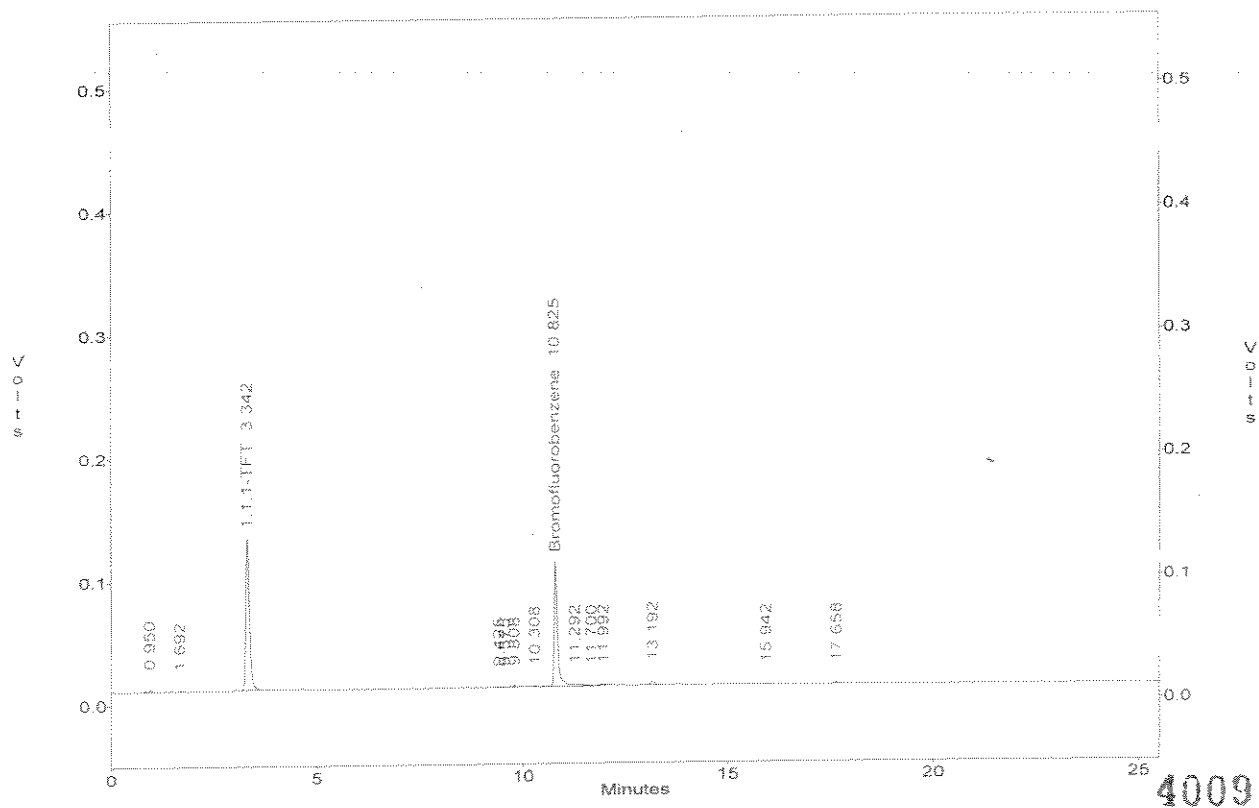
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.008
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-03 5.0ML W
Acquired : Apr 26, 2005 19:55:23
Printed : Apr 26, 2005 20:20:55
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
3	1,1,1-TFT	3.342	776888.0	23231.0	33.44
8	Bromofluorobenzene	10.825	622032.0	15791.7	39.39
G1	GASOLINE (TOTAL)		105097.0	15626.4	6.73
G2	GRO (C6-C10)		96603.0	13111.9	7.37
G3	GRO (2MP-124TMB)		75096.0	13114.6	5.73
G4	GRO (C5-C12)		105097.0	15510.5	6.78

c:\ezchrom\chrom\ed26\Ed26.008 -- Channel A



METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.    : 05D146                 Date Extracted: 04/26/05 20:31
Sample ID    : 86-S14-048             Date Analyzed: 04/26/05 20:31
Lab Samp ID  : D146-04                Dilution Factor: 1
Lab File ID  : ED26009A               Matrix       : WATER
Ext Btch ID  : VA39D13                % Moisture    : NA
Calib. Ref.  : ED26002A               Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	1.1	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	121	65-135

RL : Reporting Limit

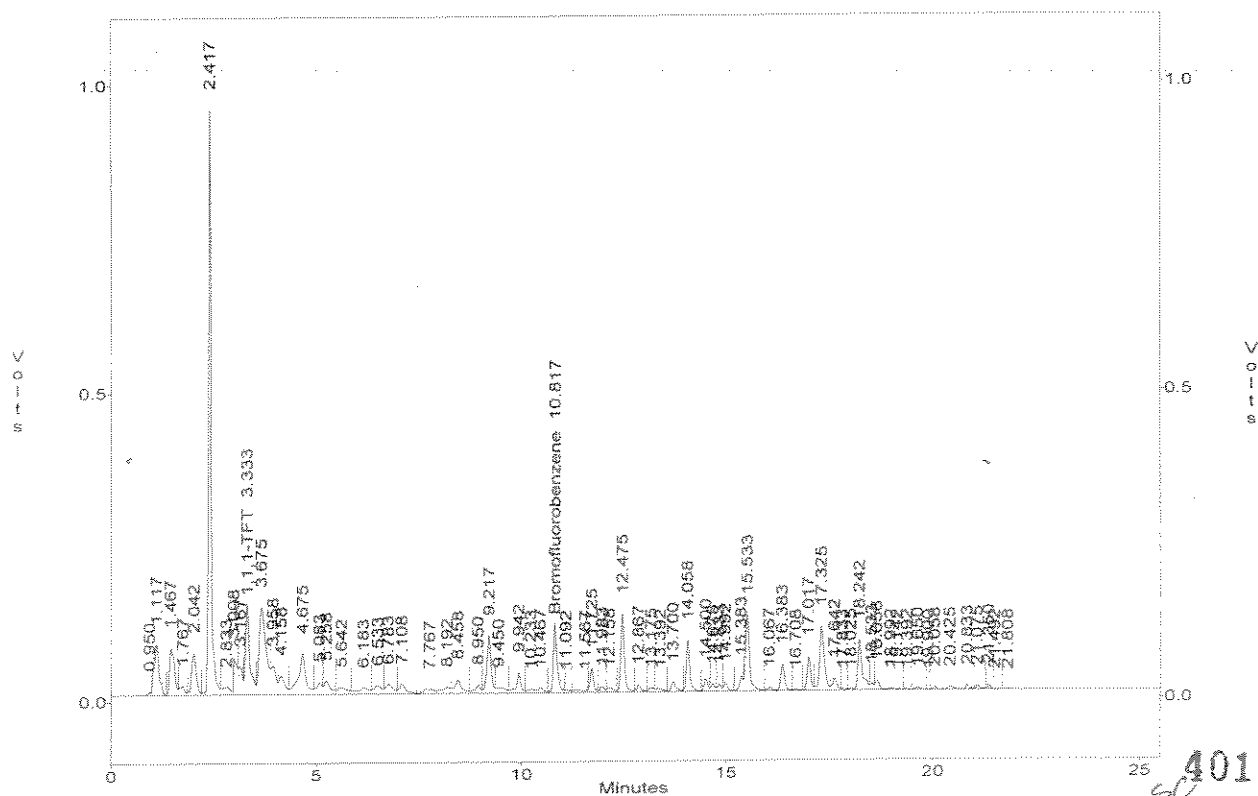
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\ed26.009
Method : c:\ezchrom\methods\vg39c30.met
Sample ID : 05D146-04 5.0ML W
Acquired : Apr 26, 2005 20:31:05
Printed : Apr 27, 2005 09:39:02
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
10	1,1,1-TFT	3.333	1068604.0	23231.0	46.00
31	Bromofluorobenzene	10.817	764205.0	15791.7	48.39
G1	GASOLINE(TOTAL)		20037456.0	15626.4	1282.28
G2	GRO(C6-C10)		13782490.0	13111.9	1051.14
G3	GRO(2MP-124TMB)		14369564.0	13114.6	1095.69
G4	GRO(C5-C12)		19028948.0	15510.5	1226.84

c:\ezchrom\chrom\ed26\ed26.009 -- Channel A



SC 4011
4/27/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 21:06
Sample ID    : 86-S14-046                   Date Analyzed: 04/26/05 21:06
Lab Samp ID  : D146-05                      Dilution Factor: 1
Lab File ID  : ED26010A                     Matrix          : WATER
Ext Btch ID  : VA39D13                      % Moisture       : NA
Calib. Ref.  : ED26002A                     Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.038J	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	96	65-135	

RL : Reporting Limit

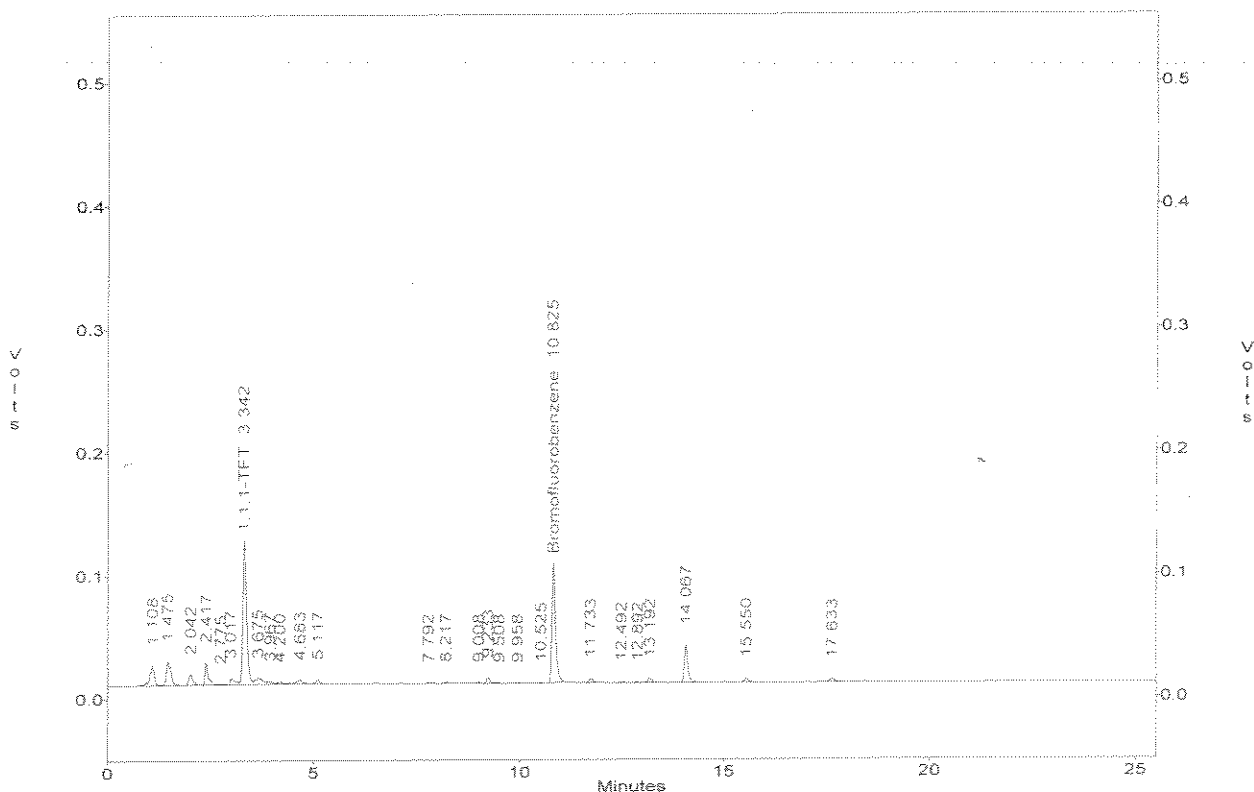
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.010
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-05 5.0ML W
Acquired : Apr 26, 2005 21:06:40
Printed : Apr 26, 2005 21:32:13
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
7	1,1,1-TFT	3.342	761738.0	23231.0	32.79
20	Bromofluorobenzene	10.825	604200.0	15791.7	38.26
G1	GASOLINE(TOTAL)		1031598.0	15626.4	66.02
G2	GRO(C6-C10)		503409.0	13111.9	38.39
G3	GRO(2MP-124TMB)		638894.0	13114.6	48.72
G4	GRO(C5-C12)		894002.0	15510.5	57.64

c:\ezchrom\chrom\ed26\Ed26.010 -- Channel A



4013

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTO 86      Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 21:42
Sample ID    : 86-S14-047                   Date Analyzed: 04/26/05 21:42
Lab Samp ID  : D146-06                      Dilution Factor: 1
Lab File ID  : ED26011A                     Matrix          : WATER
Ext Btch ID  : VA39013                      % Moisture       : NA
Calib. Ref.  : ED26002A                     Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.036J	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	96	65-135	

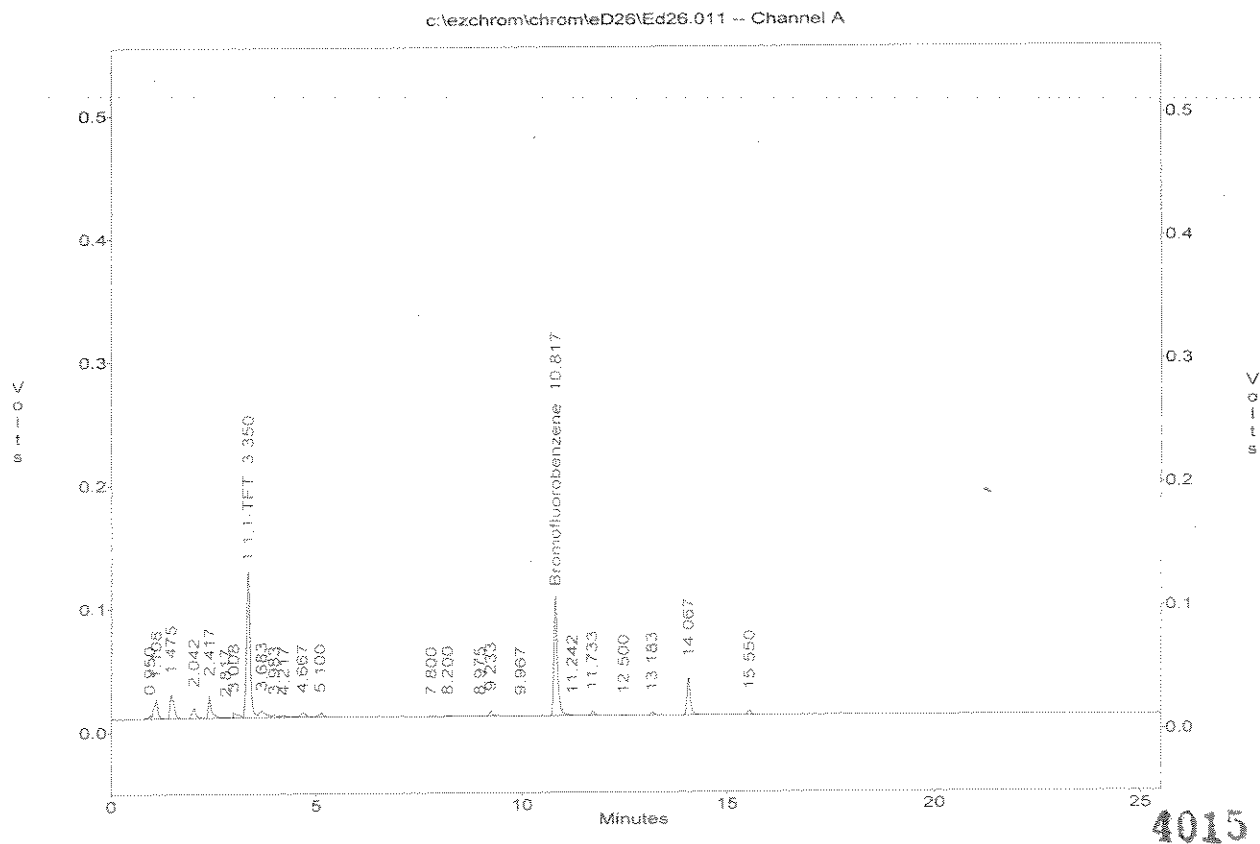
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.011
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-06 5.0ML W
Acquired : Apr 26, 2005 21:42:14
Printed : Apr 26, 2005 22:07:46
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
8	1,1,1-TFT	3.350	748013.0	23231.0	32.20
19	Bromofluorobenzene	10.817	607271.0	15791.7	38.46
G1	GASOLINE (TOTAL)		945561.0	15626.4	60.51
G2	GRO(C6-C10)		474948.0	13111.9	36.22
G3	GRO(2MP-124TMB)		606643.0	13114.6	46.26
G4	GRO(C5-C12)		832035.0	15510.5	53.64



4015

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```
=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 22:17
Sample ID    : 86-S14-050                   Date Analyzed: 04/26/05 22:17
Lab Samp ID  : D146-07                      Dilution Factor: 1
Lab File ID  : ED26012A                     Matrix          : WATER
Ext Btch ID  : VA39013                      % Moisture       : NA
Calib. Ref.  : ED26002A                     Instrument ID    : GCT039
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	88	65-135

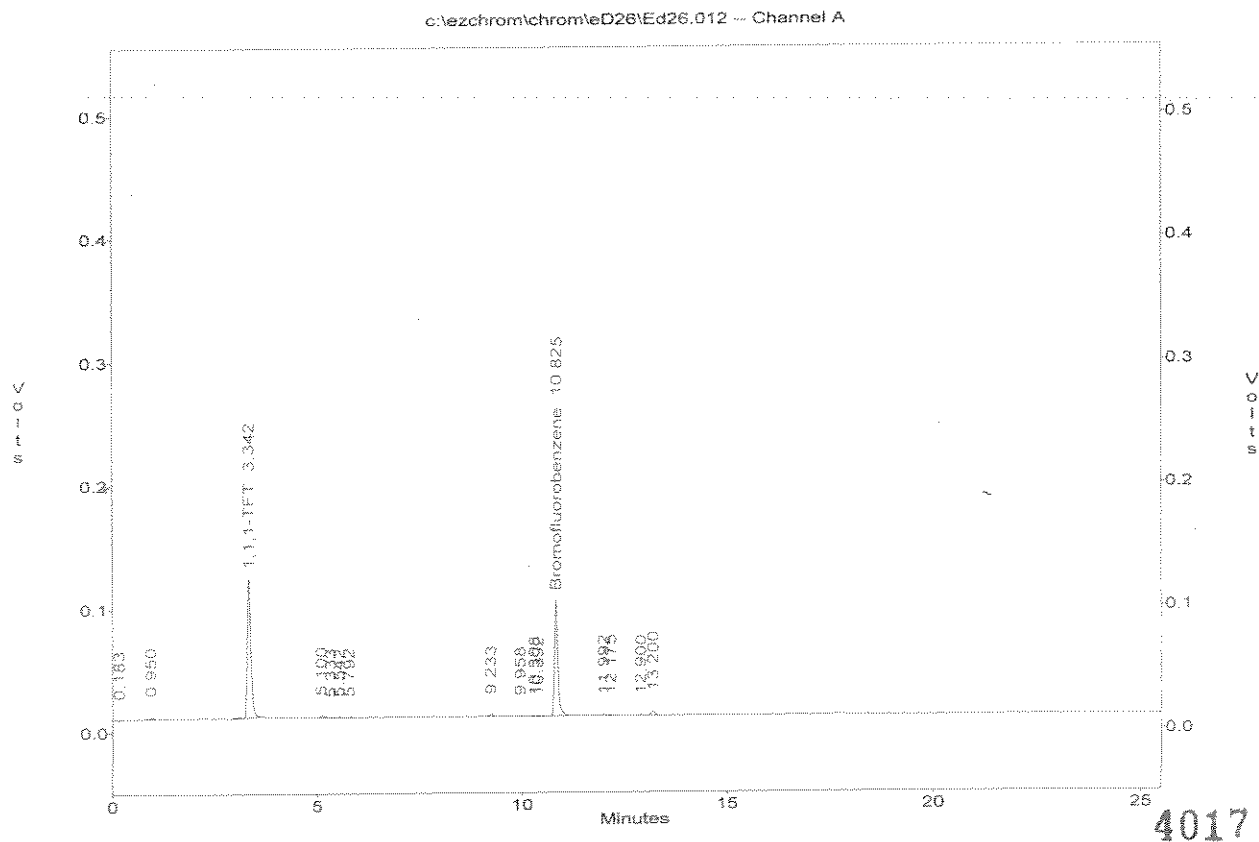
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.012
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-07 5.0ML W
Acquired : Apr 26, 2005 22:17:49
Printed : Apr 26, 2005 22:43:21
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
3	1,1,1-TFT	3.342	729896.0	23231.0	31.42
12	Bromofluorobenzene	10.825	555828.0	15791.7	35.20
G1	GASOLINE (TOTAL)		74968.0	15626.4	4.80
G2	GRO(C6-C10)		50482.0	13111.9	3.85
G3	GRO(2MP-124TMB)		50482.0	13114.6	3.85
G4	GRO(C5-C12)		74968.0	15510.5	4.83



METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```
=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 050146                 Date Extracted: 04/26/05 23:29
Sample ID: 86-S14-051                Date Analyzed: 04/26/05 23:29
Lab Samp ID: D146-08                 Dilution Factor: 1
Lab File ID: ED26014A                Matrix       : WATER
Ext Btch ID: VA39013                 % Moisture    : NA
Calib. Ref.: ED26013A                Instrument ID : GCT039
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.33	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	90	65-135

RL : Reporting Limit

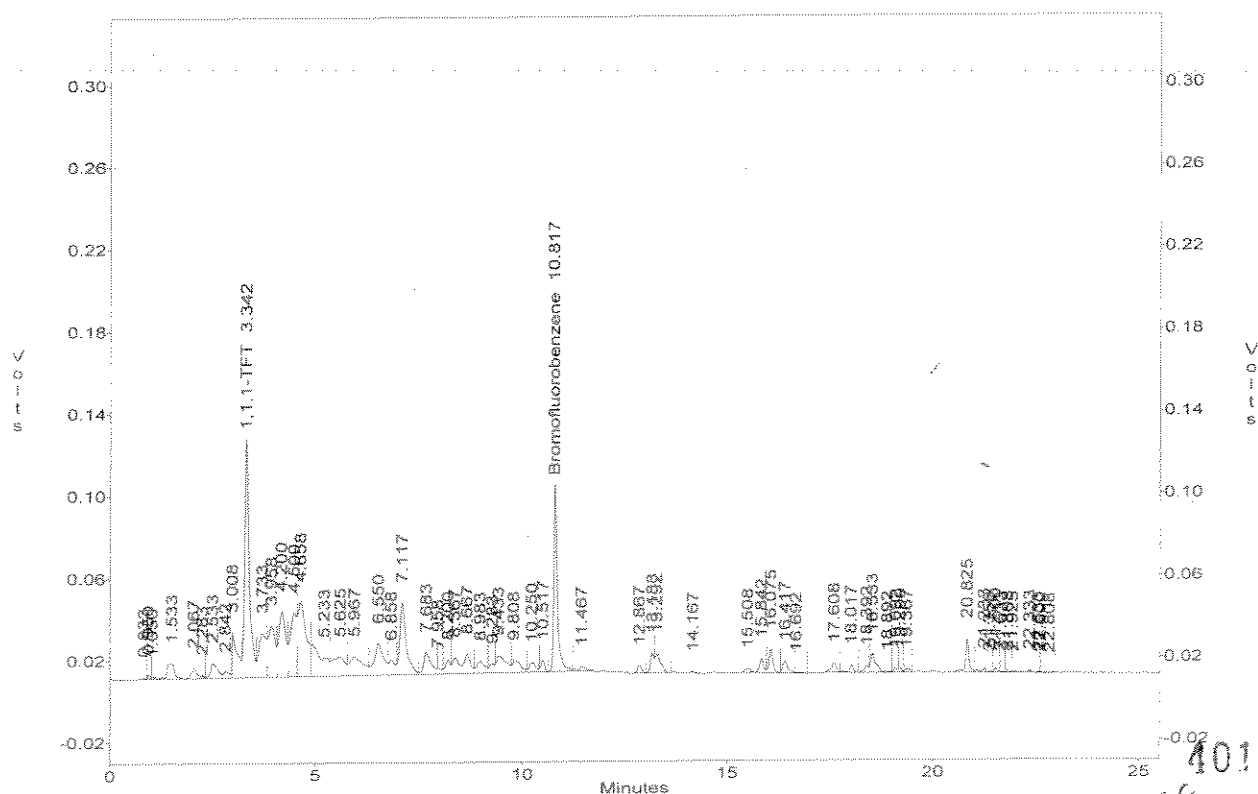
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\ed26.014
Method : c:\ezchrom\methods\vg39c30.met
Sample ID : 05D146-08 5.0ML W
Acquired : Apr 26, 2005 23:29:23
Printed : Apr 27, 2005 09:40:46
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
10	1,1,1-TFT	3.342	888414.0	23231.0	38.24
33	Bromofluorobenzene	10.817	570308.0	15791.7	36.11
G1	GASOLINE (TOTAL)		5129718.0	15626.4	328.27
G2	GRO (C6-C10)		4345490.0	13111.9	331.42
G3	GRO (2MP-124TMB)		4383382.0	13114.6	334.24
G4	GRO (C5-C12)		4933517.0	15510.5	318.08

c:\ezchrom\chrom\ed26\ed26.014 -- Channel A



4019
SC
4/27/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/27/05 00:05
Sample ID    : 86-S14-045                   Date Analyzed: 04/27/05 00:05
Lab Samp ID  : D146-09                      Dilution Factor: 1
Lab File ID  : ED26015A                     Matrix       : WATER
Ext Btch ID  : VA39D13                      % Moisture    : NA
Calib. Ref.  : ED26013A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	91	65-135

RL : Reporting Limit

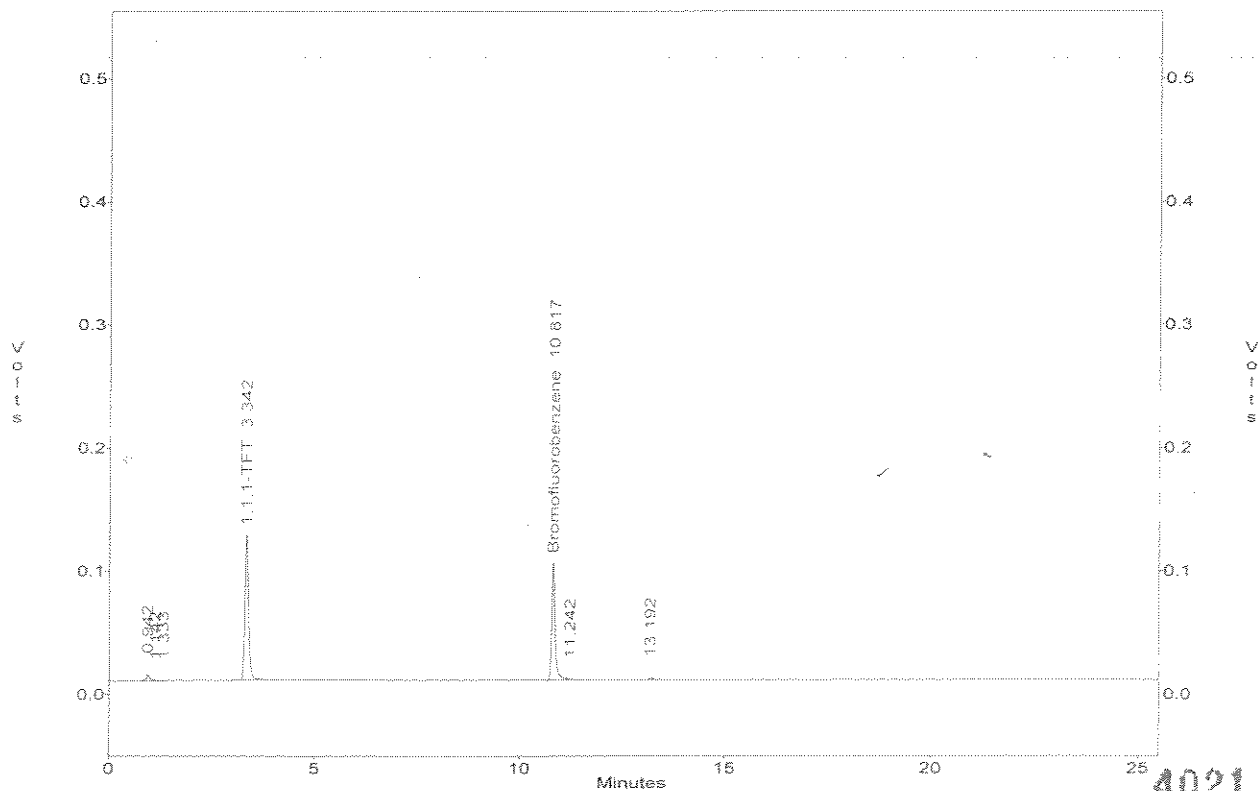
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\ed26\Ed26.015
Method : c:\ezchrom\methods\Vg39c30.met
Sample ID : 05D146-09 5.0ML W
Acquired : Apr 27, 2005 00:05:16
Printed : Apr 27, 2005 00:30:48
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
4	1,1,1-TFT	3.342	760704.0	23231.0	32.75
5	Bromofluorobenzene	10.817	573438.0	15791.7	36.31
G1	GASOLINE (TOTAL)		21918.0	15626.4	1.40
G2	GRO (C6-C10)		15271.0	13111.9	1.16
G3	GRO (2MP-124TMB)		2728.0	13114.6	0.21
G4	GRO (C5-C12)		17806.0	15510.5	1.15

c:\ezchrom\chrom\ed26\Ed26.015 -- Channel A



ORIGINAL

LDC Report# 13570A7

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: April 20 through April 21, 2005
LDC Report Date: June 3, 2005
Matrix: Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 05D146

Sample Identification

86-S14-049
86-S14-043
86-S14-052
86-S14-048
86-S14-046
86-S14-047**
86-S14-050
86-S14-051
86-S14-045

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 86-S14-046 and 86-S14-047** were identified as field duplicates. No total petroleum hydrocarbons as gasoline were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	86-S14-046	86-S14-047**	
TPH as gasoline	0.038	0.036	5

X. Field Blanks

Sample 86-S14-043 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

Moffett Airfield, UST Site 14, CTO 86

Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 05D146

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, CTO 86

Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 05D146

No Sample Data Qualified in this SDG

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC           Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.   : 050146                      Date Extracted: 04/26/05 18:44
Sample ID   : 86-S14-049                 Date Analyzed: 04/26/05 18:44
Lab Samp ID : D146-01                    Dilution Factor: 1
Lab File ID : ED26006A                   Matrix       : WATER
Ext Btch ID : VA39013                     % Moisture    : NA
Calib. Ref. : ED26002A                   Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	89	65-135

RL : Reporting Limit

4004

6/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 19:19
Sample ID    : 86-S14-043                   Date Analyzed: 04/26/05 19:19
Lab Samp ID  : D146-02                       Dilution Factor: 1
Lab File ID  : ED26007A                     Matrix       : WATER
Ext Btch ID  : VA39D13                      % Moisture    : NA
Calib. Ref.  : ED26002A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	88	65-135

RL : Reporting Limit

4006

6/6/05

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC          Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 04/22/05
Batch No.   : 05D146                     Date Extracted: 04/26/05 19:55
Sample ID   : 86-S14-052                 Date Analyzed: 04/26/05 19:55
Lab Samp ID : D146-03                    Dilution Factor: 1
Lab File ID : ED26008A                   Matrix       : WATER
Ext Btch ID : VA39D13                     % Moisture    : NA
Calib. Ref. : ED26002A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	98	65-135	

RL : Reporting Limit

4008

6/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH FW, INC           Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.    : 05D146                       Date Extracted: 04/26/05 20:31
Sample ID    : 86-S14-048                   Date Analyzed: 04/26/05 20:31
Lab Samp ID  : D146-04                       Dilution Factor: 1
Lab File ID  : ED26009A                      Matrix       : WATER
Ext Btch ID  : VA39D13                       % Moisture    : NA
Calib. Ref.  : ED26002A                      Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	1.1	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	121	65-135

RL : Reporting Limit

4010

E/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client   : TETRA TECH FW, INC           Date Collected: 04/21/05
Project  : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No. : 05D146                     Date Extracted: 04/26/05 21:06
Sample ID: 86-S14-046                 Date Analyzed: 04/26/05 21:06
Lab Samp ID: D146-05                  Dilution Factor: 1
Lab File ID: ED26010A                 Matrix       : WATER
Ext Btch ID: VA39D13                  % Moisture    : NA
Calib. Ref.: ED26002A                  Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.038J	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	96	65-135

RL : Reporting Limit

4012

6/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 04/26/05 21:42
Sample ID   : 86-S14-047             Date Analyzed: 04/26/05 21:42
Lab Samp ID : D146-06                Dilution Factor: 1
Lab File ID : ED26011A               Matrix      : WATER
Ext Btch ID : VA39D13                % Moisture   : NA
Calib. Ref. : ED26002A               Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.036J	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	96	65-135	

RL : Reporting Limit

4014

6/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC           Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.   : 050146                       Date Extracted: 04/26/05 22:17
Sample ID: 86-S14-050                     Date Analyzed: 04/26/05 22:17
Lab Samp ID: D146-07                      Dilution Factor: 1
Lab File ID: ED26012A                     Matrix       : WATER
Ext Btch ID: VA39013                      % Moisture    : NA
Calib. Ref.: ED26002A                     Instrument ID : GC1039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	88	65-135	

RL : Reporting Limit

4016

6/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC          Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 04/22/05
Batch No.   : 050146                     Date Extracted: 04/26/05 23:29
Sample ID: 86-S14-051                   Date Analyzed: 04/26/05 23:29
Lab Samp ID: D146-08                     Dilution Factor: 1
Lab File ID: ED26014A                    Matrix       : WATER
Ext Btch ID: VA39D13                     % Moisture    : NA
Calib. Ref.: ED26013A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.33	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	90	65-135

RL : Reporting Limit

4018

E/6/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 04/27/05 00:05
Sample ID   : 86-S14-045             Date Analyzed: 04/27/05 00:05
Lab Samp ID : D146-09                 Dilution Factor: 1
Lab File ID : ED26015A                Matrix      : WATER
Ext Btch ID : VA39D13                 % Moisture   : NA
Calib. Ref. : ED26013A                Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	91	65-135

RL : Reporting Limit

4020

6/6/05

LDC #: 13570A7

SDG #: 05D146

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 6/2/05

Page: 1 of 1

Reviewer: *[Signature]*2nd Reviewer: *[Signature]***METHOD:** GC TPH as Gasoline (EPA SW846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/20, 21/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	10V \leq 15%
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	diff spec
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 5 + 6
X.	Field blanks	ND	TB = 2

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-049	11	MBLEIW	21		31	
2	86-S14-043	12		22		32	
3	86-S14-052	13		23		33	
4	86-S14-048	14		24		34	
5	86-S14-046	15		25		35	
6	86-S14-047**	16		26		36	
7	86-S14-050	17		27		37	
8	86-S14-051	18		28		38	
9	86-S14-045	19		29		39	
10		20		30		40	

Notes: _____

LDC #: 13576A7
SDG #: 05D146

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: PC
2nd Reviewer: g

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u>✓</u> %D or %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 1357027
SDG #: 650146

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field duplicates?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Were field blanks identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

[illegible]

LDC #: 13570.47
SDG #: 050146

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: KL
2nd Reviewer: GR

METHOD: GC ✓ HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = $100 * (S/X)$
A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				CF (100 std)	CF (100 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD
1	10AL	3/20/05	Gasoline	12584	12584	1311.9	13112.1	8.3	8.3
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1357227
SDG #: 059146

VALIDATION FINDINGS WORKSHEET

Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC ☒ HPLC ☐

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 \times (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (Ical)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	5026002A	4/26/05	Gravelite	13111.9	-	2	12901.19	2
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1357017
SDG #: 652146

METHOD: ☒ GC ☐ HPLC

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: K
2nd reviewer: R

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:
% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 6

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
transflutemetone		40	38.46	96	96	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Page: 1 of 1
 Reviewer: MS
 2nd Reviewer: MS

[illegible]

LCSCLCNew.wpd

METHOD: ☒ GC ☐ HPLC

Y	N	N/A
Y	N	N/A

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds agree within 10% of the reported results?

$$\text{Concentration} = \frac{(A)/(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor

RF= Average response factor of the compound
In the initial calibration

V_s = Initial volume of the sample
 W_s = Initial weight of the sample
 $\%S$ = Percent Solid

Example:

Sample ID. b Compound Name gasoline

$$\text{Concentration} = \frac{(474948)}{(1311.9)(1000)} = 0.036 \text{ mg/L}$$
[illegible]

Comments:

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: April 20 through April 21, 2005
LDC Report Date: June 3, 2005
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05D146

Sample Identification

86-S14-049
86-S14-043
86-S14-052
86-S14-048
86-S14-048DL
86-S14-046
86-S14-046DL
86-S14-047**
86-S14-050
86-S14-051
86-S14-045

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles which include Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), and Methyl-tert-butyl ether (MTBE).

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
86-S14-048	All TCL compounds	15	14	J (all detects) UU (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

For the purposes of technical evaluation, all compounds were evaluated against the 20.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
86-S14-048 86-S14-046	Benzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 86-S14-046 and 86-S14-047** and samples 86-S14-046DL and 86-S14-047** were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	86-S14-046DL	86-S14-047**	
Benzene	42	38	10
Toluene	1.5	1.3	14
Xylenes, total	1.5	1.4	7

Compound	Concentration (ug/L)		RPD
	86-S14-046DL	86-S14-047**	
Benzene	46	38	19
Toluene	1.5	1.3	14
Xylenes, total	15U	1.4	Not calculable

XVII. Field Blanks

Sample 86-S14-043 was identified as a trip blank. No volatile contaminants were found in this blank.

Moffett Airfield, UST Site 14, CTO 86
Volatiles - Data Qualification Summary - SDG 05D146

SDG	Sample	Compound	Flag	A or P	Reason
05D146	86-S14-048	All TCL compounds	J (all detects) UJ (all non-detects)	A	Technical holding times
05D146	86-S14-048 86-S14-046	Benzene	J (all detects)	A	Compound quantitation and CRQLs

Moffett Airfield, UST Site 14, CTO 86
Volatiles - Laboratory Blank Data Qualification Summary - SDG 05D146

No Sample Data Qualified in this SDG

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC          Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTD 86    Date Received: 04/22/05
Batch No.   : 05D146                     Date Extracted: 05/04/05 18:37
Sample ID   : 86-S14-049                 Date Analyzed: 05/04/05 18:37
Lab Samp ID : D146-01N                   Dilution Factor: 1
Lab File ID : REQ090                     Matrix          : WATER
Ext Btch ID : V005E10                   % Moisture      : NA
Calib. Ref. : RDQ398                     Instrument ID   : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

6/6/05 2004

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC           Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 04/22/05
Batch No.   : 05D146                       Date Extracted: 05/04/05 19:13
Sample ID   : 86-S14-043                   Date Analyzed: 05/04/05 19:13
Lab Samp ID : 0146-02N                     Dilution Factor: 1
Lab File ID : REQ091                       Matrix       : WATER
Ext Btch ID : V005E10                     % Moisture    : NA
Calib. Ref. : R00398                     Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	98	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

6/6/05 2005

SW 5030B/82608
VOLATILE ORGANICS BY GC/MS

```
=====
Client      : TETRA TECH FW, INC          Date Collected: 04/20/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 04/22/05
Batch No.   : 05D146                     Date Extracted: 05/04/05 20:28
Sample ID   : 86-S14-032                 Date Analyzed: 05/04/05 20:28
Lab Samp ID : D146-03N                    Dilution Factor: 1
Lab File ID : REG093                      Matrix          : WATER
Ext Btch ID : V005E10                     % Moisture       : NA
Calib. Ref. : RDQ398                      Instrument ID    : T-005
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	102	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

2006

6/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```
=====
Client   : TETRA TECH FW, INC      Date Collected: 04/20/05
Project  : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No. : 05D146                 Date Extracted: 05/05/05 01:27
Sample ID: 86-S14-048              Date Analyzed: 05/05/05 01:27
Lab Samp ID: D146-04N              Dilution Factor: 5
Lab File ID: REQ101                Matrix       : WATER
Ext Btch ID: V005E10               % Moisture    : NA
Calib. Ref.: RDQ398                Instrument ID : T-005
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	330E	5	1
TOLUENE	3.5J	5	1
ETHYLBENZENE	1.9J	5	1
XYLENES (TOTAL)	25	15	2.5
MTBE	ND	5	1

J
↓
NJ

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-DB	97	75-125

RL: Reporting Limit

2007

6/6/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH FW, INC      Date Collected: 04/20/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.    : 05D146                 Date Extracted: 05/04/05 18:00
Sample ID:   B6-S14-048DL             Date Analyzed: 05/04/05 18:00
Lab Samp ID: D146-04T                 Dilution Factor: 100
Lab File ID: REQ089                   Matrix          : WATER
Ext Btch ID: V005E10                  % Moisture       : NA
Calib. Ref.: RDQ398                    Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	2100	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

2008

6/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/05/05 00:50
Sample ID   : 86-S14-046             Date Analyzed: 05/05/05 00:50
Lab Samp ID : D146-05R               Dilution Factor: 1
Lab File ID : REQ100                 Matrix       : WATER
Ext Btch ID : V005E10                % Moisture    : NA
Calib. Ref. : RDQ398                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	42E J	1	.2
TOLUENE	1.5	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	1.5J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

2009

E/G/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/04/05 23:35
Sample ID   : 86-S14-046DL           Date Analyzed: 05/04/05 23:35
Lab Samp ID : D146-05T               Dilution Factor: 5
Lab File ID : REQ098                 Matrix       : WATER
Ext Btch ID : V005E10                % Moisture    : NA
Calib. Ref. : RDQ398                 Instrument ID : T-Q05
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	46	5	1
TOLUENE	1.5J	5	1
ETHYLBENZENE	ND	5	1
XYLENES (TOTAL)	ND	15	2.5
MTBE	ND	5	1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	97	75-125

RL: Reporting Limit

2010

6/6/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/04/05 22:20
Sample ID   : 86-S14-047             Date Analyzed: 05/04/05 22:20
Lab Samp ID : D146-06R               Dilution Factor: 1
Lab File ID : REQ096                 Matrix      : WATER
Ext Btch ID : V005E10                % Moisture   : NA
Calib. Ref. : RDQ398                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	38	1	.2
TOLUENE	1.3	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	1.4	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	96	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

2011

6/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC          Date Collected: 04/21/05
Project     : UST SITE 14, MPA, CTO B6    Date Received: 04/22/05
Batch No.   : 05D146                     Date Extracted: 05/04/05 21:05
Sample ID   : 86-S14-050                 Date Analyzed: 05/04/05 21:05
Lab Samp ID : D146-07R                   Dilution Factor: 1
Lab File ID : REQ094                     Matrix      : WATER
Ext Btch ID : V005E10                    % Moisture   : NA
Calib. Ref. : RDQ398                     Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	98	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

2020

6/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/04/05 22:57
Sample ID:  B6-S14-051               Date Analyzed: 05/04/05 22:57
Lab Samp ID: D146-08R                Dilution Factor: 1
Lab File ID: REQ097                  Matrix       : WATER
Ext Btch ID: V005E10                 % Moisture    : NA
Calib. Ref.: RDG398                  Instrument ID : I-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-DB	103	75-125

RL: Reporting Limit

2021

6/6/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH FW, INC      Date Collected: 04/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 04/22/05
Batch No.   : 05D146                 Date Extracted: 05/04/05 21:43
Sample ID: 86-S14-045                Date Analyzed: 05/04/05 21:43
Lab Samp ID: D146-09R                Dilution Factor: 1
Lab File ID: REQ095                  Matrix       : WATER
Ext Btch ID: V005E10                 % Moisture    : NA
Calib. Ref.: RDQ398                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	97	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit

2022

6/6/05

LDC #: 13570A1

SDG #: 05D146

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 4/21/05

Page: 1 of 1

Reviewer: R

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B) BTEX + MTBE

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 4/20, 21/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	no SPC RLS ↓ %D, CV ≤ 20
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	dist spec
VIII.	Laboratory control samples	A	LCs/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 6 + 6, 7 + 8
XVII.	Field blanks	ND	TB = 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-049	11	86-S14-045	21		31	
2	86-S14-043	12	MPK1W	22		32	
3	86-S14-052	13		23		33	
4	86-S14-048	14		24		34	
5	86-S14-048DL	15		25		35	
6	86-S14-046	16		26		36	
7	86-S14-046DL	17		27		37	
8	86-S14-047**	18		28		38	
9	86-S14-050	19		29		39	
10	86-S14-051	20		30		40	

LDC #: 13570A1
SDG #: 05D146

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		<input checked="" type="checkbox"/>		
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>			
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>			
Was a curve fit used for evaluation?		<input checked="" type="checkbox"/>		
Did the initial calibration meet the curve fit acceptance criteria of > 0.990 ?			<input checked="" type="checkbox"/>	
Were all percent relative standard deviations (%RSD) $\leq 30\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>			
Were all percent differences (%D) $\leq 25\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>			
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	<input checked="" type="checkbox"/>			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		<input checked="" type="checkbox"/>		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		<input checked="" type="checkbox"/>		
Was a MS/MSD analyzed every 20 samples of each matrix?		<input checked="" type="checkbox"/>		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			<input checked="" type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>			

LDC #: 3570A
SDG #: 050146

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: R
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. LLLL.
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. MMMM.
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNN. NNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS. SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT. TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU. UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV. VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 13570A


SDG #: 050146

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

Page: 1 of 1

Reviewer:

2nd Reviewer: 

All circled dates have exceeded the technical holding times.

Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

[illegible]

TECHNICAL HOLDING TIME CRITERIA

Water unpreserved:

Water preserved:

Soil:

Aromatic within 7 days, non-aromatic within 14 days of sample collection.

Both within 14 days of sample collection.

Both within 14 days of sample collection.

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: *α*
2nd Reviewer: *R*

✓	N	N/A
---	---	-----

[illegible]

Comments: See sample calculation verification worksheet for recalculations

LDC #: 13570A1
SDG #: 050146

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: AL
2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

☒ Y ☐ N ☐ N/A
☒ Y ☐ N ☐ N/A

Were field duplicate pairs identified in this SDG?

Were target compounds identified in the field duplicate pairs?

Compound	Concentration (<u>ug/L</u>)		RPD
	6	8	
V	<u>42</u> <u>42</u>	<u>38</u>	<u>10</u>
CC	<u>1.5</u>	<u>1.3</u>	<u>14</u>
GG	<u>1.5</u>	<u>1.4</u>	<u>7</u>

Compound	Concentration (<u>ug/L</u>)		RPD
	7	8	
V	<u>46</u>	<u>38</u>	<u>19</u>
CC	<u>1.5</u>	<u>1.3</u>	<u>14</u>
GG	<u>1.54</u>	<u>1.4</u>	<u>2 VC</u>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 13570A
SDG #: 05046

VALIDATION FINDINGS WORKSHEET

Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: PK
2nd Reviewer: Q

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_s/C_s)/(A_u/C_u)$
average RRF = sum of the RRFs/number of standards
%RSD = $100 * (S/X)$

A_u = Area of compound,
 C_u = Concentration of compound,
 S = Standard deviation of the RRFs
 X = Mean of the RRFs

A_s = Area of associated internal standard
 C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated		Reported		Recalculated	
				RRF (10 std)	RRF (10 std)	RRF (10 std)	RRF (10 std)	Average RRF (Initial)	Average RRF (Initial)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD	%RSD	%RSD
1	1CAL	4/21/05	Methylene chloride (1st internal standard)	0.419	0.419	0.419	0.418	0.418	0.418	0.418	0.418	5.16	5.16	5.20	5.20
			Trichlorethene (2nd internal standard)	1.828	1.828	1.828	1.800	1.800	1.800	1.800	1.800	4.23	4.23	4.22	4.22
			Toluene (3rd internal standard)												
2			Methylene chloride (1st internal standard)												
			Trichlorethene (2nd internal standard)												
			Toluene (3rd internal standard)												
3			Methylene chloride (1st internal standard)												
			Trichlorethene (2nd internal standard)												
			Toluene (3rd internal standard)												
4			Methylene chloride (1st internal standard)												
			Trichlorethene (2nd internal standard)												
			Toluene (3rd internal standard)												

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13570A
SDG #: 050146

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: RL
2nd Reviewer: RL

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
 $\text{RRF} = (A_s / C_s) / (A_{is} / C_{is})$

Where: ave. RRF = initial calibration average RRF

RRF = continuing calibration RRF

A_s = Area of compound,

A_{is} = Area of associated internal standard

C_s = Concentration of compound,

C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	RE0084	5/4/05	Methylene chloride (1st internal standard)	0.410	0.436	4.3	0.436	4.4
			Trichlorethene (2nd internal standard)	1.800	1.859	3.3	1.859	3.3
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1357021
SDG #: 050146

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: K
2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 8

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	9.9	99	99	0
Bromofluorobenzene	↓	9.59	96	96	↓
1,2-Dichloroethane-d4	↓	10.35	103	103	↓
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: AC
2nd Reviewer: 0

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

Where: SSC = Spiked sample concentration
SA = Spike added

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

[illegible][illegible]

LDC #: 1357041

SDG #: 05D146

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: AL

2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

~~Y~~ N N/A

Were all reported results recalculated and verified for all level IV samples?

Y	N	N/A
---	---	-----

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_s)(RRF)(V_s)(\%S)}$$

Example:

Sample I.D. 8 V

Conc. = $\frac{7946970}{(156683)(1.800)}$ () () ()
= 28 ug/L

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_s	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

[illegible]



NUMBER 10809

CHAIN-OF-CUSTODY RECORD

CHAIN-OF-CUSTODY RECORD

PROJECT NAME		PURCHASE ORDER NO.		ANALYSES REQUIRED		LABORATORY NAME		Project Information Section	
PROJECT LOCATION		PROJECT NO.				LABORATORY ID (FOR LABORATORY)		Do not submit to Laboratory	
SAMPLER NAME		AIRBILL NUMBER				LABORATORY ID (FOR LABORATORY)			
PROJECT CONTACT		PROJECT CONTACT PHONE NUMBER				LABORATORY ID (FOR LABORATORY)			
SAMPLE ID		DATE COLLECTED		TIME COLLECTED		NO. OF CONTAINER		LEVEL	
								3 4	
								T Y P E	
								T A T	
WST Site 14	70848 Task 33								
Moffett Field, CA	1990.086E								
Peter Girozani	851138684442								
Lynn Jefferson	949-756-7558								
86-S14-053	7-21-05	0700	6	X	W	10 DAY	X	X	80150 (791 P)
86-S14-059	7-21-05	0850	6	X	W	10 DAY	X	X	80150 (791 P)
86-S14-060	7-21-05	0920	6	X	W	10 DAY	X	X	
86-S14-062	7-21-05	0950	6	X	W	10 DAY	X	X	
86-S14-061	7-21-05	1025	10	X	W	10 DAY	X	X	
86-S14-055	7-21-05	1105	6	X	W	10 DAY	X	X	
86-S14-056	7-21-05	1130	6	X	W	10 DAY	X	X	
86-S14-057	7-21-05	1155	6	X	W	10 DAY	X	X	
86-S14-058	7-21-05	1200	6	X	W	10 DAY	X	X	
7/21/05									
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	DATE	LABORATORY INSTRUCTIONS/COMMENTS					
COMPANY	TIME	COMPANY	TIME						
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	DATE	COMPOSITE DESCRIPTION					
COMPANY	TIME	COMPANY	TIME						
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	DATE	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)					
COMPANY	TIME	COMPANY	TIME	TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN					
				COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN					

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05G174

**SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS**

Nine (9) water samples were received on 07/22/05 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample G175-05 was spiked. All recoveries were within QC limit.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86

SDG NO. : 05G174
Instrument ID : T-001

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Notes
MBLK1W	V001G320	1	NA	07/31/0511:35	07/31/0511:35	RGV364	RGV308	Method Blank
LCS1W	V001G32L	1	NA	07/31/0509:41	07/31/0509:41	RGV361	RGV308	Lab Control Sample (LCS)
LCD1W	V001G32C	1	NA	07/31/0510:19	07/31/0510:19	RGV362	RGV308	LCS Duplicate
86-S14-053	G174-01	1	NA	07/31/0512:13	07/31/0512:13	RGV365	RGV308	Field Sample
86-S14-059	G174-02	1	NA	07/31/0512:50	07/31/0512:50	RGV366	RGV308	Field Sample
86-S14-060	G174-03	1	NA	07/31/0513:28	07/31/0513:28	RGV367	RGV308	Field Sample
86-S14-055	G174-06	1	NA	07/31/0515:22	07/31/0515:22	RGV370	RGV308	Field Sample
86-S14-056	G174-07	1	NA	07/31/0516:00	07/31/0516:00	RGV371	RGV308	Field Sample
86-S14-057	G174-08	1	NA	07/31/0516:38	07/31/0516:38	RGV372	RGV308	Field Sample
86-S14-058	G174-09	1	NA	07/31/0517:16	07/31/0517:16	RGV373	RGV308	Field Sample
MBLK2W	V001H020	1	NA	08/02/0503:36	08/02/0503:36	RHV029	RGV308	Method Blank
LCS2W	V001H02X	1	NA	08/02/0511:11	08/02/0511:11	RHV041	RGV308	Lab Control Sample (LCS)
LCD2W	V001H02C	1	NA	08/02/0502:19	08/02/0502:19	RHV027	RGV308	LCS Duplicate
86-S14-062	G174-04R	1	NA	08/02/0504:14	08/02/0504:14	RHV030	RGV308	Field Sample
86-S14-056DL	G174-07T	10	NA	08/02/0504:52	08/02/0504:52	RHV031	RGV308	Diluted Sample
86-S14-061MS	G174-05R	1	NA	08/02/0509:18	08/02/0509:18	RHV038	RGV308	Field Sample
86-S14-061MSD	G174-05M	1	NA	08/02/0509:55	08/02/0509:55	RHV039	RGV308	Matrix Spike Sample (MS)
MBLK3W	V001H05Q	1	NA	08/02/0510:33	08/02/0510:33	RHV040	RGV308	MS Duplicate (MSD)
LCS3W	V001H05L	1	NA	08/04/0501:00	08/04/0501:00	RHV070	RGV308	Method Blank
LCD3W	V001H05C	1	NA	08/04/0501:38	08/04/0501:38	RHV067	RGV308	Lab Control Sample (LCS)
86-S14-057DL	G174-08T	100	NA	08/04/0509:14	08/04/0509:14	RHV080	RGV308	LCS Duplicate
86-S14-058DL	G174-09T	100	NA	08/04/0509:51	08/04/0509:51	RHV081	RGV308	Diluted Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

2603



SW 50308/B2608
VOLATILE ORGANICS BY GC/MS

=====
Client : TETRA TECH EC, INC Date Collected: 07/21/05
Project : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No. : 05G174 Date Extracted: 07/31/05 12:13
Sample ID: 86-S14-053 Date Analyzed: 07/31/05 12:13
Lab Samp ID: G174-01 Dilution Factor: 1
Lab File ID: RGV365 Matrix : WATER
Ext Btch ID: V001G32 % Moisture : NA
Calib. Ref.: RGV308 Instrument ID : T-001
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	109	65-135
BROMOFLUOROBENZENE	120	75-125
TOLUENE-D8	113	75-125

RL: Reporting Limit

2004

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 07/31/05 12:50
Sample ID   : 86-S14-059             Date Analyzed: 07/31/05 12:50
Lab Samp ID : G174-02                 Dilution Factor: 1
Lab File ID : RGV366                 Matrix          : WATER
Ext Btch ID : V001G32                % Moisture       : NA
Calib. Ref. : RGV308                 Instrument ID    : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-D8	99	75-125

RL: Reporting Limit



SW 50308/82608
VOLATILE ORGANICS BY GC/MS

=====

Client : TETRA TECH EC, INC	Date Collected: 07/21/05
Project : UST SITE 14, MFA, CYD 86	Date Received: 07/22/05
Batch No. : 05G174	Date Extracted: 07/31/05 13:28
Sample ID: B6-S14-060	Date Analyzed: 07/31/05 13:28
Lab Samp ID: G174-03	Dilution Factor: 1
Lab File ID: RGV367	Matrix : WATER
Ext Btch ID: V001G32	% Moisture : NA
Calib. Ref.: RGV308	Instrument ID : T-001

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

SW 5030B/B260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.   : 05G174                       Date Extracted: 08/02/05 04:14
Sample ID: 86-S14-062                     Date Analyzed: 08/02/05 04:14
Lab Samp ID: G174-04R                     Dilution Factor: 1
Lab File ID: RHV030                       Matrix      : WATER
Ext Btch ID: V001H02                     % Moisture   : NA
Calib. Ref.: RGV30B                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	92	65-135	
BROMOFLUOROBENZENE	106	75-125	
TOLUENE-D8	96	75-125	

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.   : 05G174                       Date Extracted: 08/02/05 09:18
Sample ID   : 86-S14-061                   Date Analyzed: 08/02/05 09:18
Lab Samp ID : G174-05R                     Dilution Factor: 1
Lab File ID : RHV038                       Matrix       : WATER
Ext Btch ID : V001H02                      % Moisture    : NA
Calib. Ref. : RGV30B                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	95	65-135	
BROMOFLUOROBENZENE	112	75-125	
TOLUENE-D8	106	75-125	

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 07/31/05 15:22
Sample ID    : 86-S14-055                   Date Analyzed: 07/31/05 15:22
Lab Samp ID  : G174-06                       Dilution Factor: 1
Lab File ID  : RGV370                       Matrix          : WATER
Ext Btch ID  : V001G32                       % Moisture       : NA
Calib. Ref.  : RGV308                       Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

SW 90308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC          Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.    : 05G174                     Date Extracted: 07/31/05 16:00
Sample ID    : 86-S14-056                 Date Analyzed: 07/31/05 16:00
Lab Samp ID  : G174-07                    Dilution Factor: 1
Lab File ID  : RGV371                     Matrix          : WATER
Ext Btch ID  : V001G32                     % Moisture      : NA
Calib. Ref.  : RGV308                     Instrument ID   : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	98E	1	.2
TOLUENE	7.4	1	.2
ETHYLBENZENE	1	1	.2
XYLENES (TOTAL)	15	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	119	65-135
BROMOFLUOROBENZENE	114	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50306/82606
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 08/02/05 04:52
Sample ID    : 86-S14-0560L           Date Analyzed: 08/02/05 04:52
Lab Samp ID  : G174-07T               Dilution Factor: 10
Lab File ID  : RHV031                 Matrix       : WATER
Ext Btch ID  : V001H02                % Moisture    : NA
Calib. Ref.  : RGV308                 Instrument ID : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	88	10	2
TOLUENE	6.1J	10	2
ETHYLBENZENE	ND	10	2
XYLENES (TOTAL)	9.9J	30	5
MTBE	ND	10	2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	92	65-135	
BROMOFLUOROBENZENE	101	75-125	
TOLUENE-D8	102	75-125	

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 07/31/05 16:38
Sample ID:  B6-S14-057               Date Analyzed: 07/31/05 16:38
Lab Samp ID: G174-08                 Dilution Factor: 1
Lab File ID: RGV372                  Matrix       : WATER
Ext Btch ID: V001G32                 % Moisture    : NA
Calib. Ref.: RGV308                  Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	92E	1	.2
TOLUENE	10	1	.2
ETHYLBENZENE	2.7	1	.2
XYLENES (TOTAL)	41	3	.5
MTBE	ND	1	.2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	111	65-135	
BROMOFLUOROBENZENE	112	75-125	
TOLUENE-D8	98	75-125	

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : USY SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 08/04/05 09:14
Sample ID: 86-S14-057DL              Date Analyzed: 08/04/05 09:14
Lab Samp ID: G174-081                Dilution Factor: 100
Lab File ID: RHV080                  Matrix          : WATER
Ext Btch ID: V001H05                 % Moisture       : NA
Calib. Ref.: RGV308                  Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	3000	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	98	65-135	
BROMOFLUOROBENZENE	112	75-125	
TOLUENE-D8	104	75-125	

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 056174                 Date Extracted: 07/31/05 17:16
Sample ID   : 86-S14-058             Date Analyzed: 07/31/05 17:16
Lab Samp ID : G174-09                 Dilution Factor: 1
Lab File ID : RGV373                 Matrix       : WATER
Ext Btch ID : V001632                % Moisture    : NA
Calib. Ref. : RGV308                 Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	95E	1	.2
TOLUENE	11	1	.2
ETHYLBENZENE	2.8	1	.2
XYLENES (TOTAL)	41	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	113	65-135
BROMOFLUOROBENZENE	115	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

Quantitation Report (QT Reviewed)

Data File : E:\HPCHEM\1\DATA\05G30\RGV373.D

Acq On : 31 Jul 2005 5:16 pm

Sample : 05G174-09 25mls

Misc : DF=1

MS Integration Params: 524INT.P

Quant Time: Aug 1 15:37 2005

Vial: 17

Operator: AS

Inst : TO01

Multiplr: 1.00

Quant Results File: VO01G29.RES

Quant Method : E:\HPCHEM\1\METHODS\VO01G29.M (RTE Integrator)

Title : METHOD 8260 25mls

Last Update : Sat Jul 30 12:49:38 2005

Response via : Initial Calibration

DataAcq Meth : VO01G29

AS 8/4
R/R @ 25/100
See R/V08/

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) 1,4-DIFLUOROBENZENE	11.36	114	1686032	10.00	ug/l	0.01
35) CHLOROBENZENE-D5	16.63	117	1385974	10.00	ug/l	0.01
64) 1,2-DICHLOROBENZENE-D4	22.26	152	470859	10.00	ug/l	0.03

System Monitoring Compounds

34) 1,2-Dichloroethane-d4	10.77	65	368868	11.32	ug/l	0.03
Spiked Amount	10.000		Recovery	=	113.20%	
47) Toluene-d8	13.92	98	1871944	9.77	ug/l	0.01
Spiked Amount	10.000		Recovery	=	97.70%	
68) 4-Bromofluorobenzene	18.94	95	646125	11.47	ug/l	0.01
Spiked Amount	10.000		Recovery	=	114.70%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
13) tert-Butyl alcohol	6.43	59	135828	81.37	ug/l	98
21) Isopropyl ether (DIPE)	8.16	45	10433588	54.15	ug/l	93
39) Benzene	10.94	78	23447906	94.68	ug/l	98
48) Toluene	14.05	91	2687180	10.55	ug/l	99
60) Ethylbenzene	16.76	91	794752	2.78	ug/l	98
61) m-Xylene & p-Xylene	16.91	91	6801246	32.81	ug/l	99
62) o-Xylene	17.76	91	1684990	8.21	ug/l	99
65) Isopropylbenzene	18.42	105	2722396	12.37	ug/l	98
70) trans-1,4-Dichloro-2-buten	19.23	53	32648	8.75	ug/l	54
71) n-Propylbenzene	19.24	91	7748977	24.15	ug/l	99
73) 1,3,5-Trimethylbenzene	19.55	105	264359	1.51	ug/l	92
76) tert-Butylbenzene	20.28	119	98913	0.57	ug/l	98
77) 1,2,4-Trimethylbenzene	20.39	105	439827	2.56	ug/l	100
78) sec-Butylbenzene	20.73	105	399011	1.48	ug/l	99
79) p-Isopropyltoluene	21.01	119	164063	0.92	ug/l	98
87) Naphthalene	26.64	128	3972743	53.60	ug/l	98

2015

(#) = qualifier out of range (m) = manual integration

RGV373.D VO01G29.M

Mon Aug 01 15:37:50 2005

Page 1

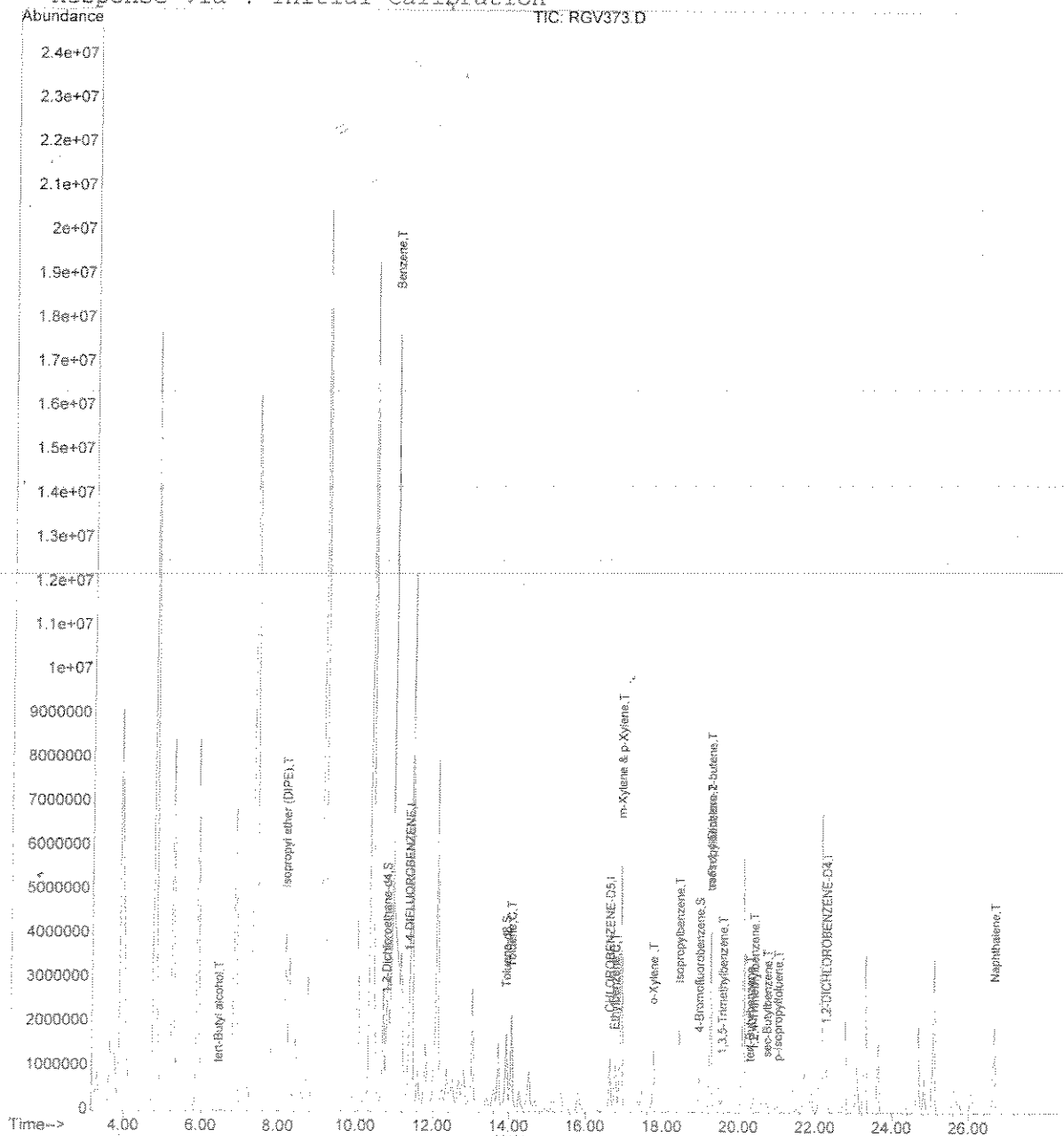
Quantitation Report

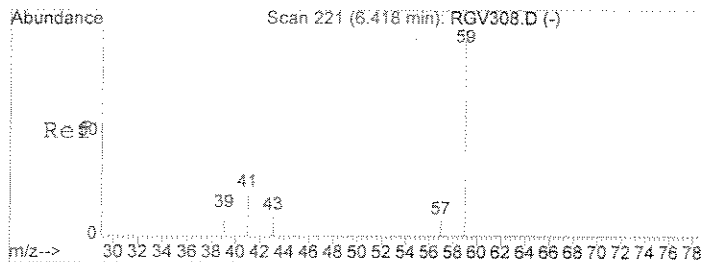
Data File : E:\HPCHEM\1\DATA\05G30\RGV373.D
Acq On : 31 Jul 2005 5:16 pm
Sample : 05G174-09 25mls
Misc : DF=1
MS Integration Params: 524INT.P
Quant Time: Aug 1 15:37 2005

Vial: 17
Operator: AS
Inst : T001
Multiplr: 1.00

Quant Results File: V001G29.RES

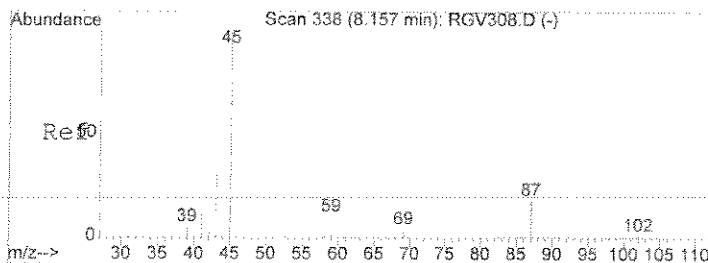
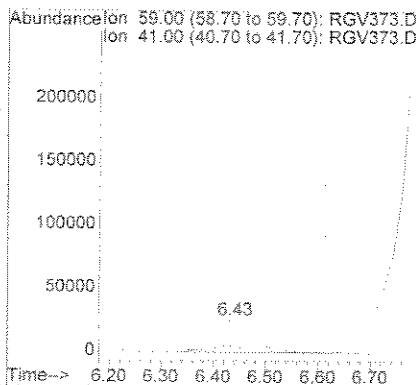
Method : E:\HPCHEM\1\METHODS\V001G29.M (RTE Integrator)
Title : METHOD 8260 25mls
Last Update : Sat Jul 30 12:49:38 2005
Response via : Initial Calibration





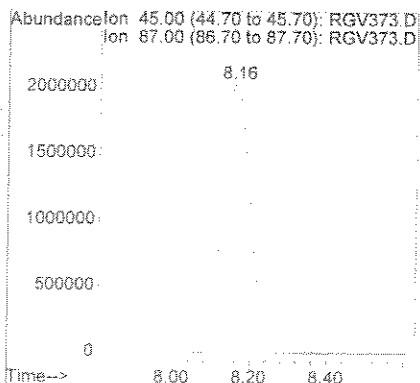
#13
tert-Butyl alcohol
Concen: 81.37 ug/l
RT: 6.43 min Scan# 222
Delta R.T. 0.02 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

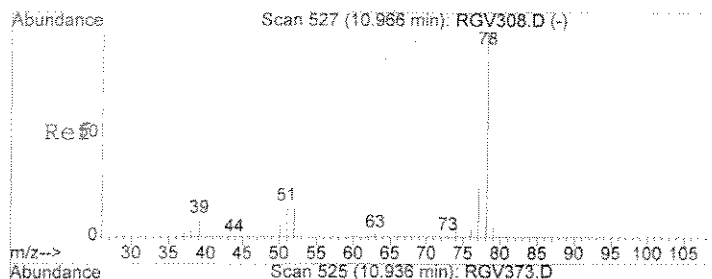
Tgt Ion: 59 Resp: 135828
Ion Ratio Lower Upper
59 100
41 18.8 0.0 49.8



#21
Isopropyl ether (DIPE)
Concen: 54.15 ug/l
RT: 8.16 min Scan# 338
Delta R.T. -0.00 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

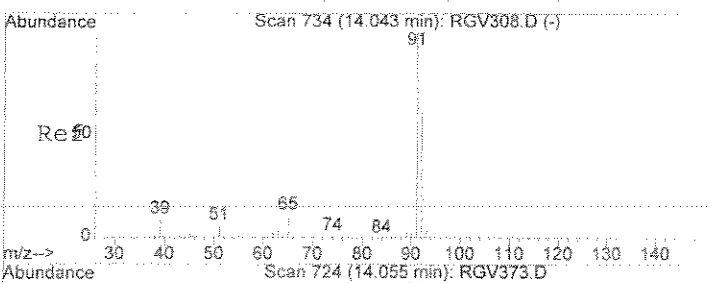
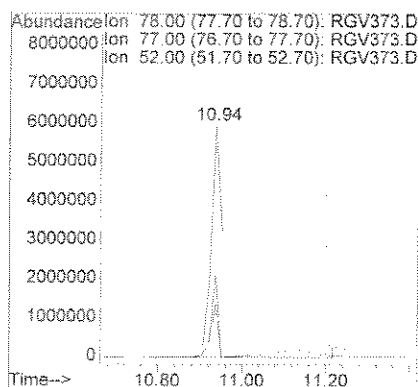
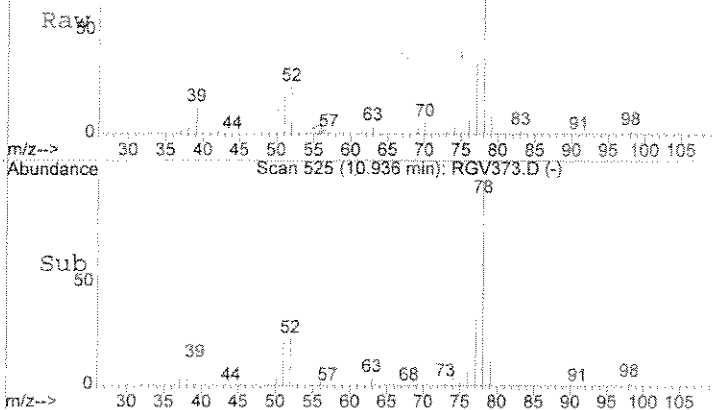
Tgt Ion: 45 Resp: 10433588
Ion Ratio Lower Upper
45 100
87 19.3 0.0 46.5





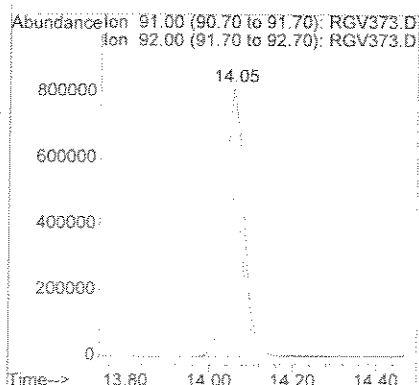
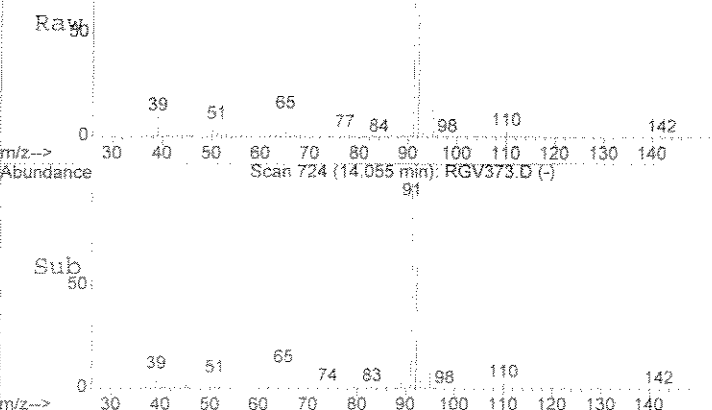
#39
Benzene
Concen: 94.68 ug/l
RT: 10.94 min Scan# 525
Delta R.T. -0.03 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion: 78 Resp: 23447906
Ion Ratio Lower Upper
78 100
77 24.7 0.0 53.6
52 15.9 0.0 45.1

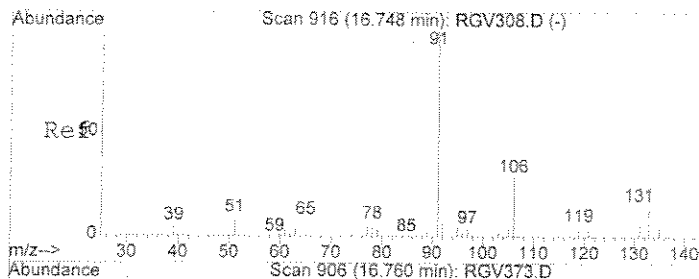


#48
Toluene
Concen: 10.55 ug/l
RT: 14.05 min Scan# 724
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion: 91 Resp: 2687180
Ion Ratio Lower Upper
91 100
92 59.7 30.1 90.1

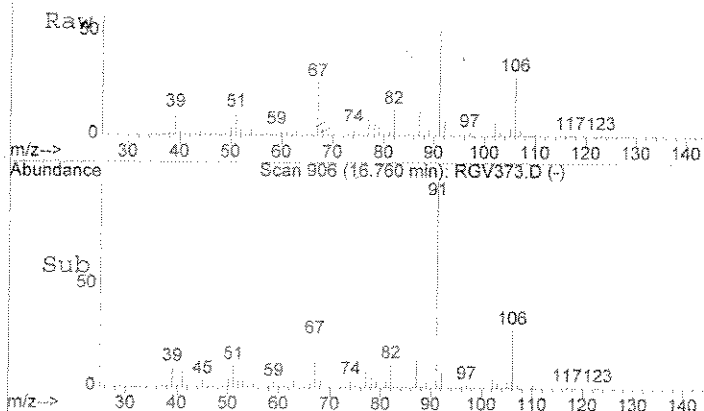


2018

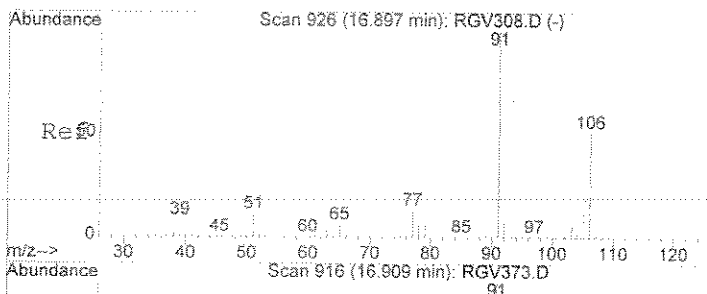
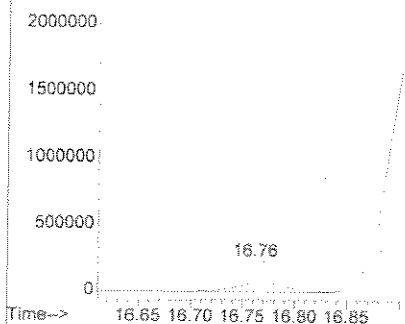


#60
Ethylbenzene
Concen: 2.78 ug/l
RT: 16.76 min Scan# 906
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion: 91 Resp: 794752
Ion Ratio Lower Upper
91 100
106 30.5 0.0 59.3

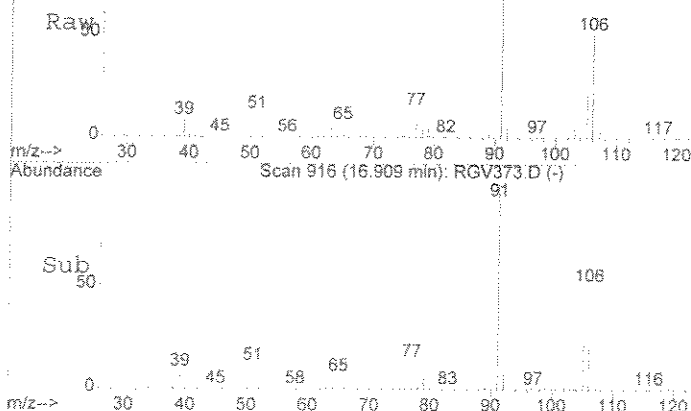


Abundance Ion 91.00 (90.70 to 91.70): RGV373.D
Ion 106.00 (105.70 to 106.70): RGV373

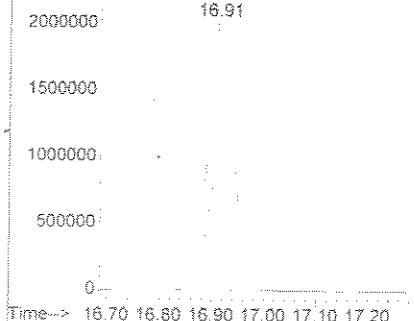


#61
m-Xylene & p-Xylene
Concen: 32.81 ug/l
RT: 16.91 min Scan# 916
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

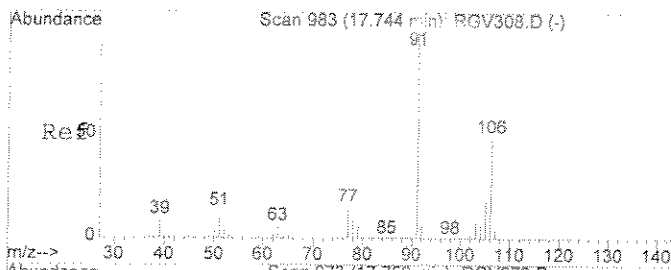
Tgt Ion: 91 Resp: 6801246
Ion Ratio Lower Upper
91 100
106 50.7 20.3 80.3



Abundance Ion 91.00 (90.70 to 91.70): RGV373.D
Ion 106.00 (105.70 to 106.70): RGV373

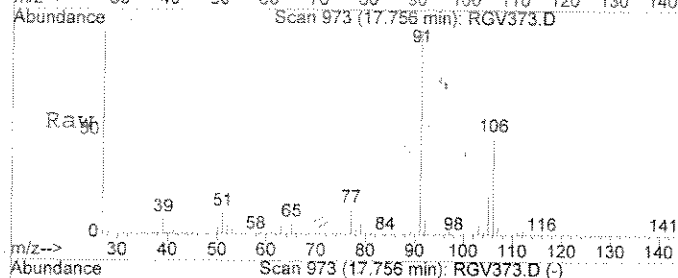


2019

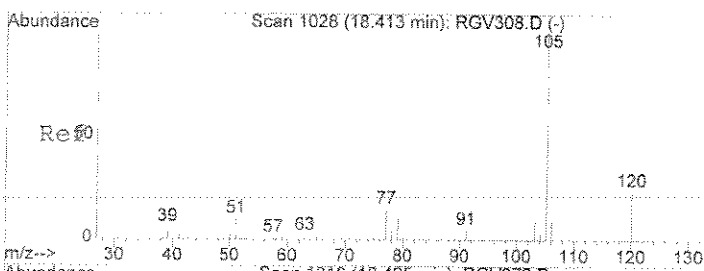
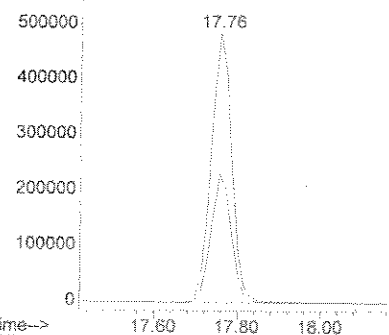


#62
o-Xylene
Concen: 8.21 ug/l
RT: 17.76 min Scan# 973
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion: 91 Resp: 1684990
Ion Ratio Lower Upper
91 100
106 47.2 17.7 77.7

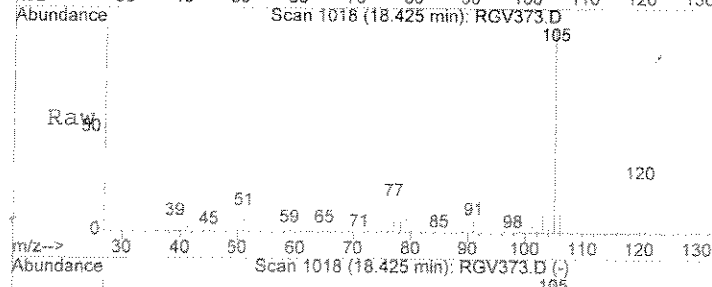


Abundance Ion 91.00 (90.70 to 91.70): RGV373.D
Ion 106.00 (105.70 to 106.70): RGV373.D

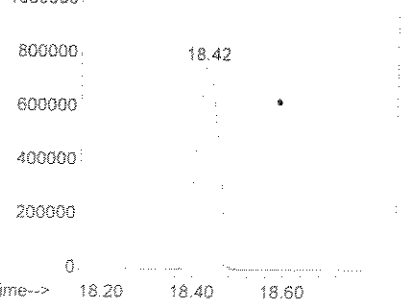


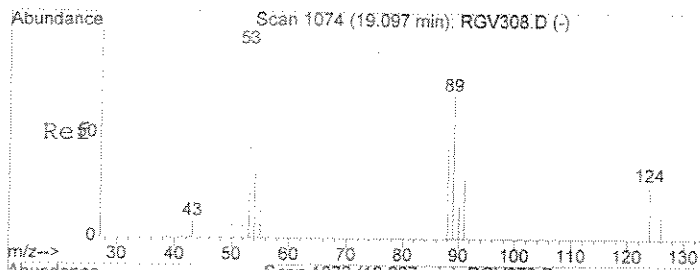
#65
Isopropylbenzene
Concen: 12.37 ug/l
RT: 18.42 min Scan# 1018
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion: 105 Resp: 2722396
Ion Ratio Lower Upper
105 100
120 24.6 0.0 54.5
79 11.4 0.0 43.3
103 8.9 0.0 38.5



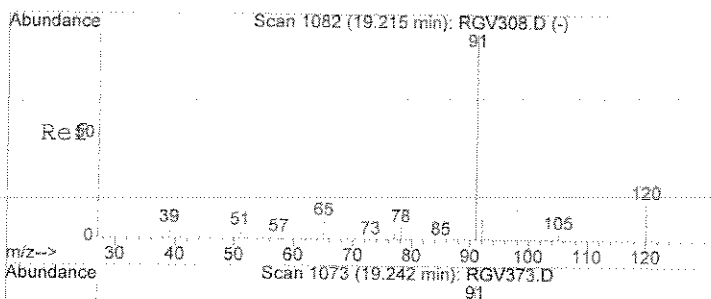
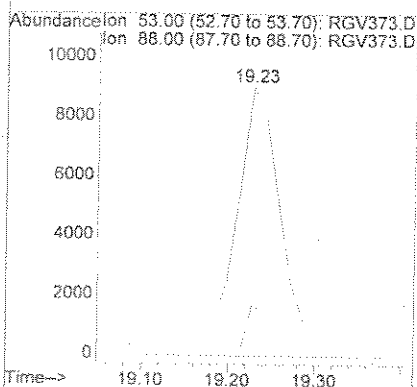
Abundance Ion 105.00 (104.70 to 105.70): RGV373.D
Ion 120.00 (119.70 to 120.70): RGV373.D
Ion 79.00 (78.70 to 79.70): RGV373.D
Ion 103.00 (102.70 to 103.70): RGV373.D





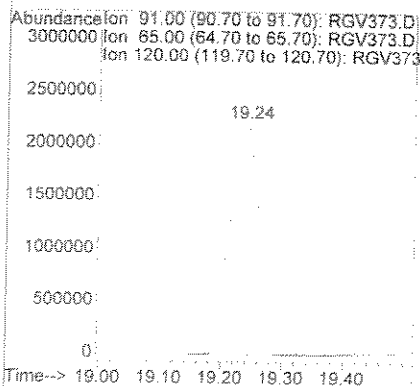
#70
trans-1,4-Dichloro-2-butene
Concen: 8.75 ug/l
RT: 19.23 min Scan# 1072
Delta R.T. 0.13 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

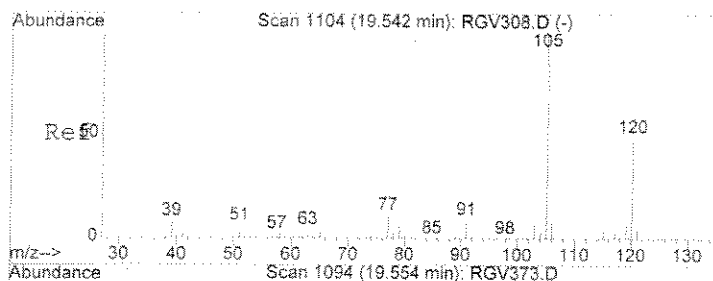
Tgt Ion: 53 Resp: 32648
Ion Ratio Lower Upper
53 100
88 11.8 10.5 70.5



#71
n-Propylbenzene
Concen: 24.15 ug/l
RT: 19.24 min Scan# 1073
Delta R.T. 0.03 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

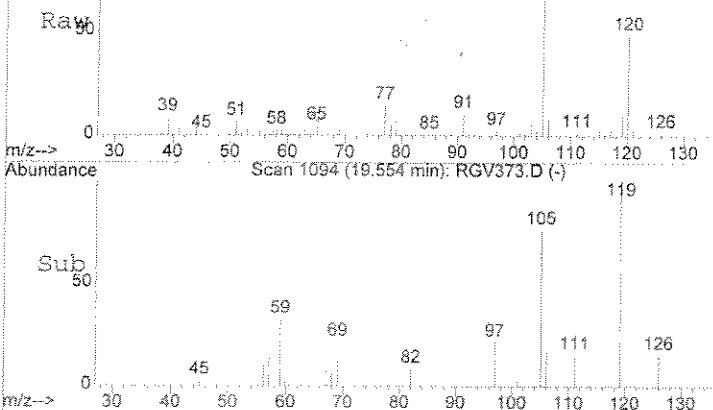
Tgt Ion: 91 Resp: 7748977
Ion Ratio Lower Upper
91 100
65 9.1 0.0 39.2
120 19.8 0.0 48.9





#73
1,3,5-Trimethylbenzene
Concen: 1.51 ug/l
RT: 19.55 min Scan# 1094
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion	Ratio	Lower	Upper
105	100		
120	56.3	19.9	79.9
119	12.7	0.0	41.3

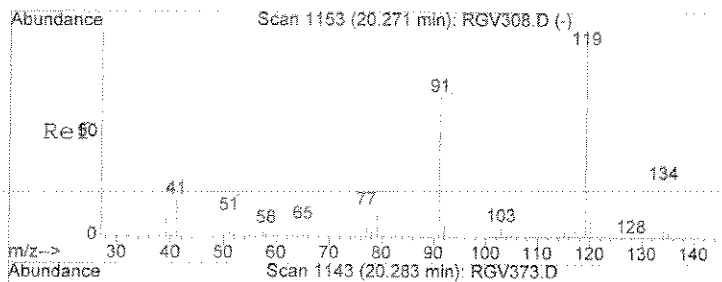
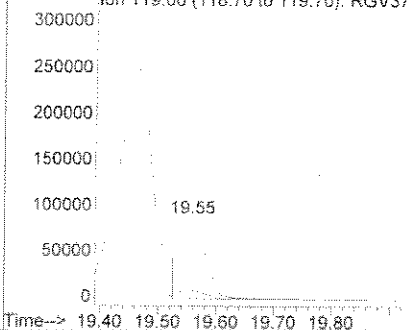


Abundance

Ion 105.00 (104.70 to 105.70): RGV373

Ion 120.00 (119.70 to 120.70): RGV373

Ion 119.00 (118.70 to 119.70): RGV373



#76
tert-Butylbenzene
Concen: 0.57 ug/l
RT: 20.28 min Scan# 1143
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

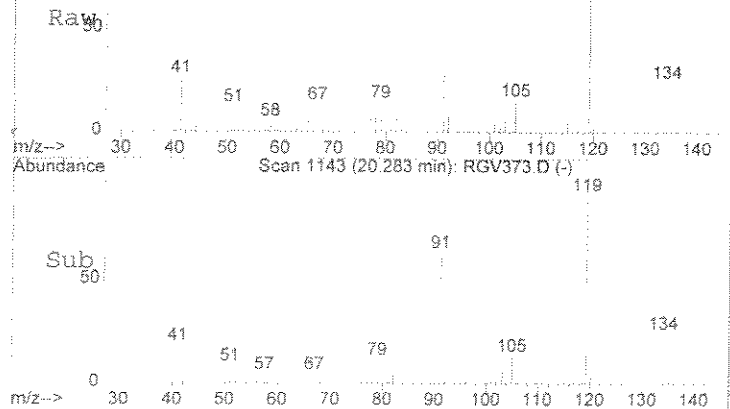
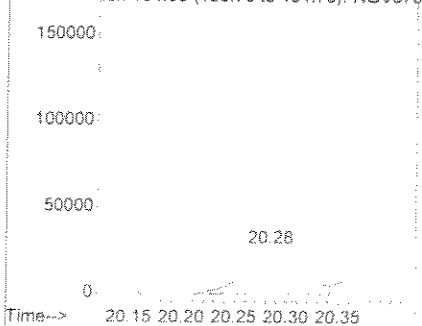
Tgt Ion	Ratio	Lower	Upper
119	100		
91	68.8	40.5	100.5
134	23.5	0.0	52.1

Abundance

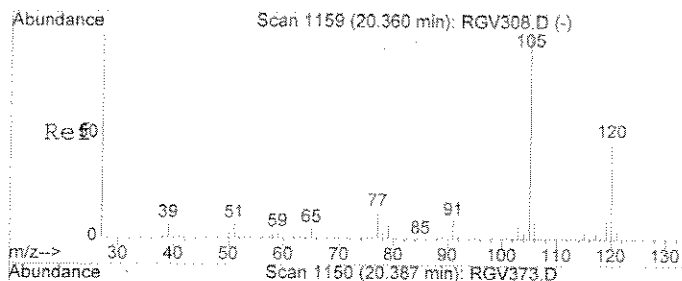
Ion 119.00 (118.70 to 119.70): RGV373

Ion 91.00 (90.70 to 91.70): RGV373.D

Ion 134.00 (133.70 to 134.70): RGV373

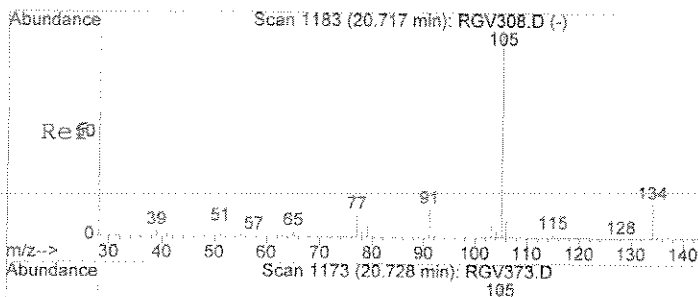
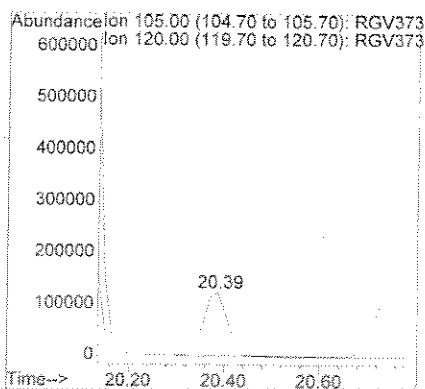
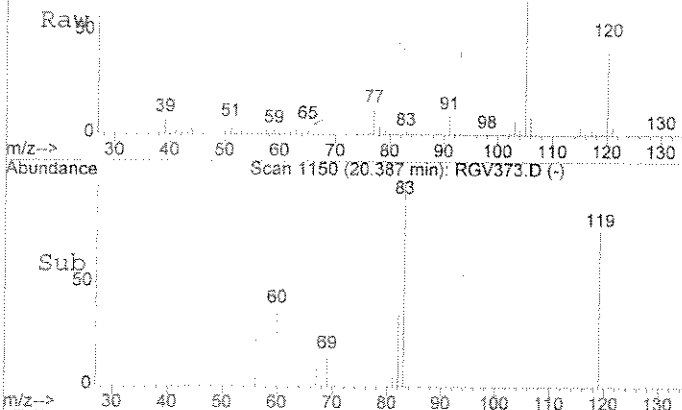


2022



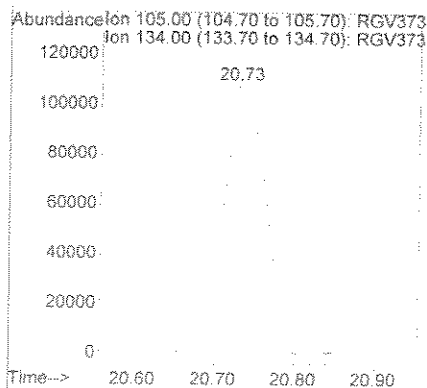
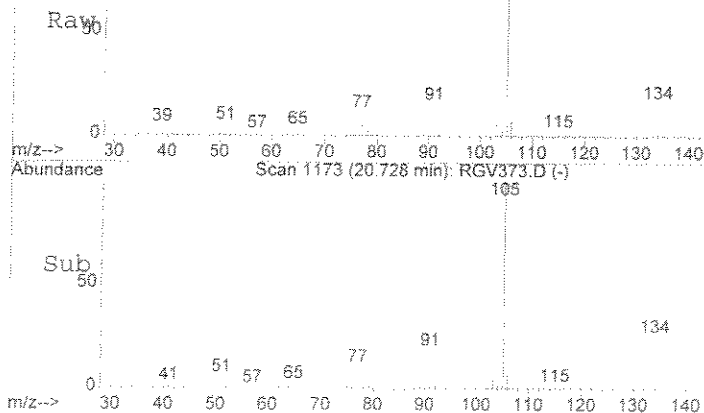
#77
1,2,4-Trimethylbenzene
Concen: 2.56 ug/l
RT: 20.39 min Scan# 1150
Delta R.T. 0.03 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

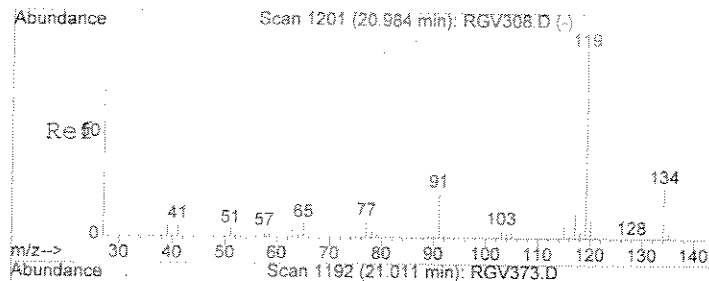
Tgt Ion: 105 Resp: 439827
Ion Ratio Lower Upper
105 100
120 46.4 16.1 76.1



#78
sec-Butylbenzene
Concen: 1.48 ug/l
RT: 20.73 min Scan# 1173
Delta R.T. 0.01 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

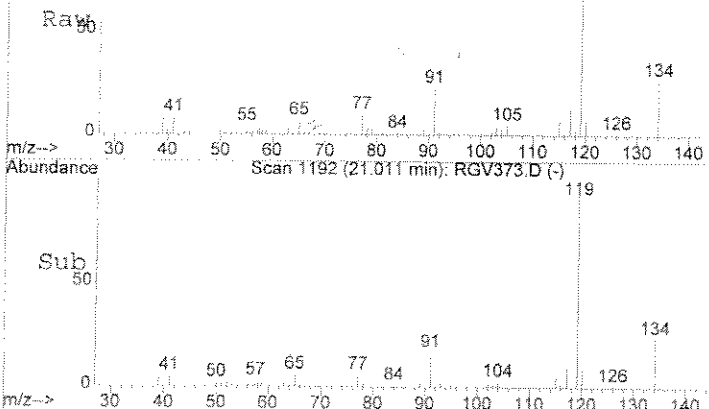
Tgt Ion: 105 Resp: 399011
Ion Ratio Lower Upper
105 100
134 16.5 0.0 46.7





#79
p-Isopropyltoluene
Concen: 0.92 ug/l
RT: 21.01 min Scan# 1192
Delta R.T. 0.03 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

Tgt Ion	Ratio	Lower	Upper
119	100		
91	24.0	0.0	52.6
134	25.1	0.0	55.4

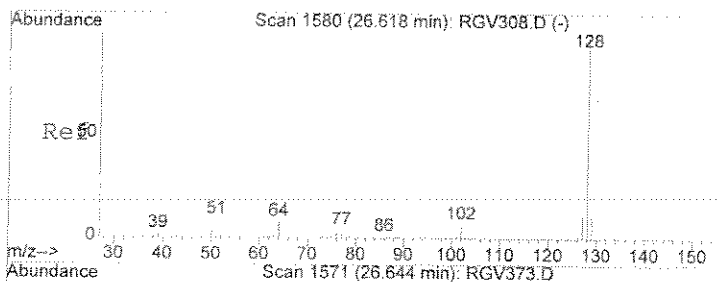
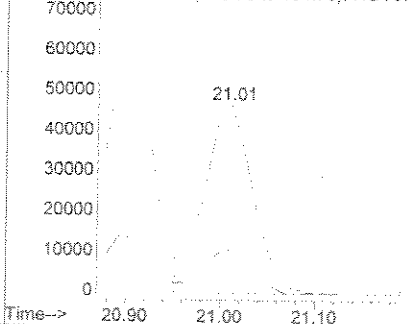


Abundance

Ion 119.00 (118.70 to 119.70): RGV373

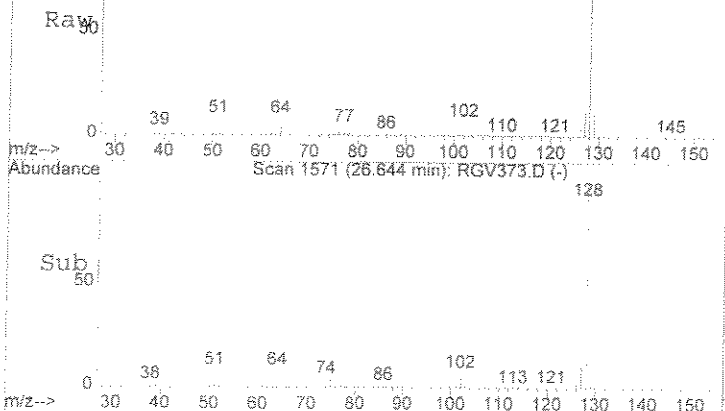
Ion 91.00 (90.70 to 91.70): RGV373.D

Ion 134.00 (133.70 to 134.70): RGV373



#87
Naphthalene
Concen: 53.60 ug/l
RT: 26.64 min Scan# 1571
Delta R.T. 0.03 min
Lab File: RGV373.D
Acq: 31 Jul 2005 5:16 pm

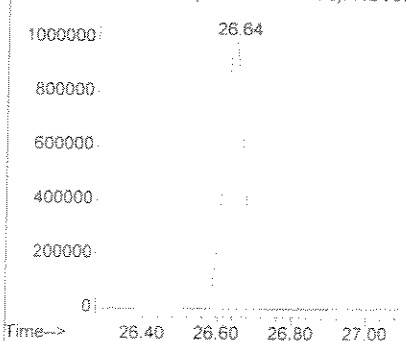
Tgt Ion	Ratio	Lower	Upper
128	100		
127	12.3	0.0	41.4



Abundance

Ion 128.00 (127.70 to 128.70): RGV373

Ion 127.00 (126.70 to 127.70): RGV373



SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 08/04/05 09:51
Sample ID   : 86-S14-058DL           Date Analyzed: 08/04/05 09:51
Lab Samp ID : G174-091               Dilution Factor: 100
Lab File ID : RHV081                 Matrix          : WATER
Ext Btch ID : V001H05                % Moisture       : NA
Calib. Ref. : RGV308                 Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	3000	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit



Quantitation Report (QT Reviewed)

Data File : E:\HPCHEM\1\DATA\05H03\RHV081.D

Vial: 19

Acq On : 4 Aug 2005 9:51 am

Operator: AS

Sample : 05G174-09I 250uls

Inst : TO01

Misc : DF=100

Multiplr: 1.00

MS Integration Params: 524INT.P

Quant Time: Aug 4 13:36 2005

Quant Results File: VO01G29.RES

Quant Method : E:\HPCHEM\1\METHODS\VO01G29.M (RTE Integrator)

Title : METHOD 8260 25mls

Last Update : Sat Jul 30 12:49:38 2005

Response via : Initial Calibration

DataAcq Meth : VO01G29

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	11.36	114	1191058	10.00	ug/l	0.00
35) CHLOROBENZENE-D5	16.62	117	882107	10.00	ug/l	0.00
64) 1,2-DICHLOROBENZENE-D4	22.24	152	321809	10.00	ug/l	0.00
System Monitoring Compounds						
34) 1,2-Dichloroethane-d4	10.75	65	224781	9.77	ug/l	0.00
Spiked Amount 10.000			Recovery	=	97.70%	0.00
47) Toluene-d8	13.92	98	1190842	9.76	ug/l	0.00
Spiked Amount 10.000			Recovery	=	97.60%	0.00
68) 4-Bromofluorobenzene	18.94	95	396979	10.32	ug/l	0.00
Spiked Amount 10.000			Recovery	=	103.20%	0.00
Target Compounds						
21) Isopropyl ether (DIPE)	8.17	45	74448	0.55	ug/l	97
39) Benzene	10.98	78	4793348	30.41	ug/l	99

(#) = qualifier out of range (m) = manual integration
RHV081.D VO01G29.M Thu Aug 04 13:36:30 2005

2026

Page 1

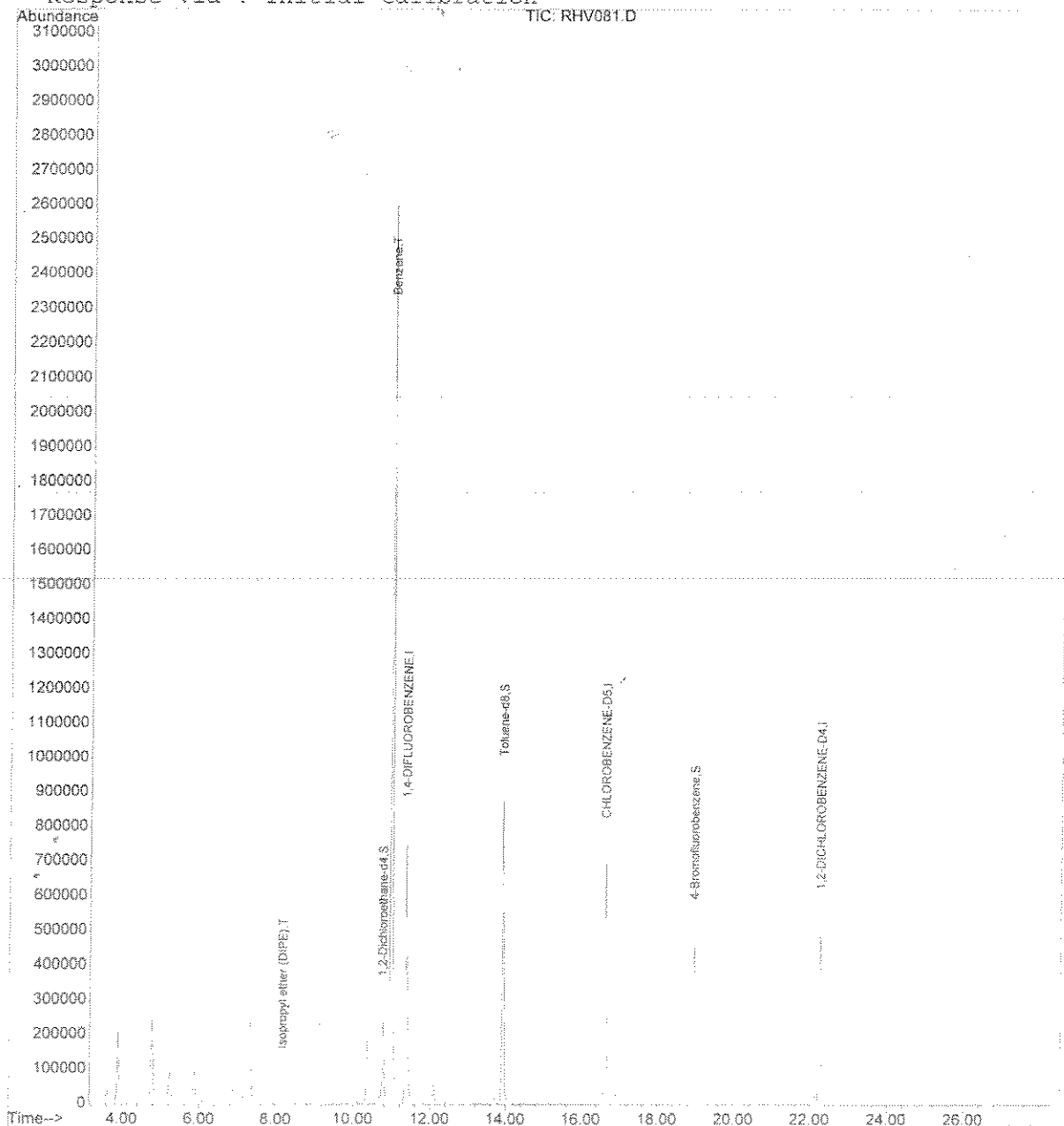
Quantitation Report

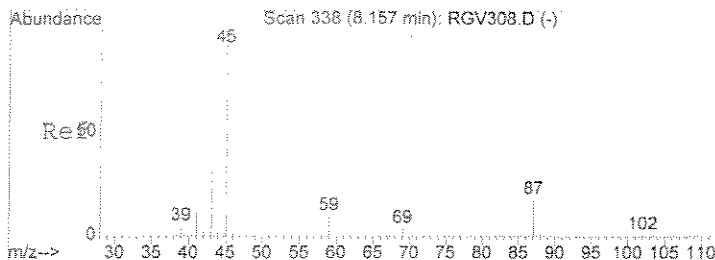
Data File : E:\HPCHEM\1\DATA\05H03\RHV081.D
Acq On : 4 Aug 2005 9:51 am
Sample : 05G174-09I 250uls
Misc : DF=100
MS Integration Params: 524INT.P
Quant Time: Aug 4 13:36 2005

Vial: 19
Operator: AS
Inst : TO01
Multiplr: 1.00

Quant Results File: VO01G29.RES

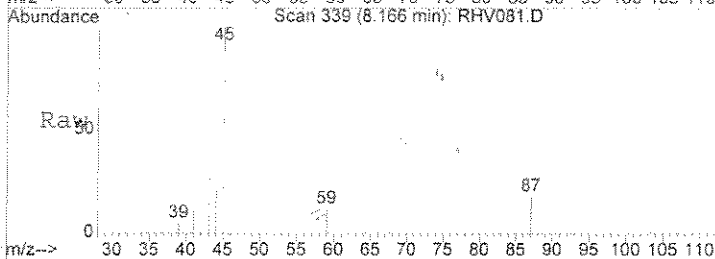
Method : E:\HPCHEM\1\METHODS\VO01G29.M (RTE Integrator)
Title : METHOD 8260 25mls
Last Update : Sat Jul 30 12:49:38 2005
Response via : Initial Calibration



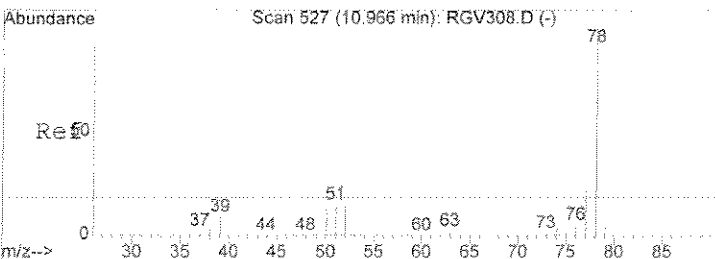
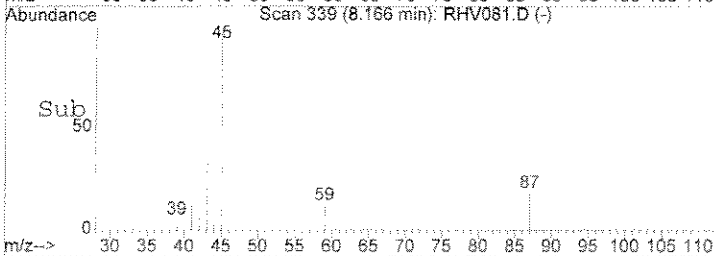
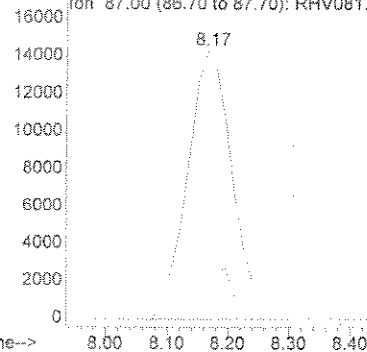


#21
Isopropyl ether (DIPE)
Concen: 0.55 ug/l
RT: 8.17 min Scan# 339
Delta R.T. 0.01 min
Lab File: RGV081.D
Acq: 4 Aug 2005 9:51 am

Tgt Ion: 45 Resp: 74448
Ion Ratio Lower Upper
45 100
87 17.7 0.0 46.5

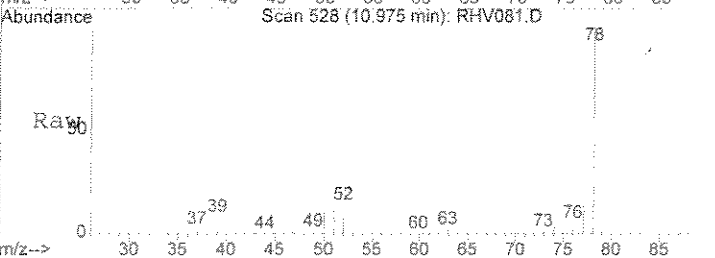


Abundance Ion 45.00 (44.70 to 45.70): RGV081.D
Ion 87.00 (86.70 to 87.70): RGV081.D

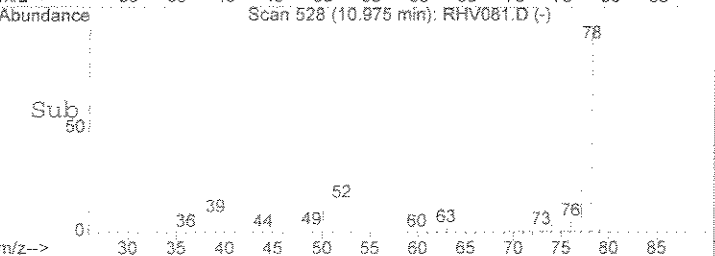
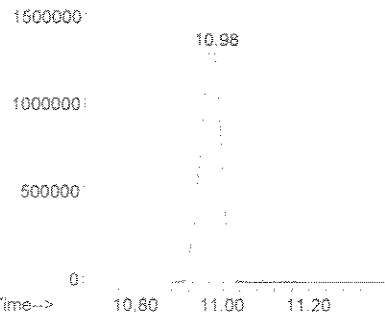


#39
Benzene
Concen: 30.41 ug/l
RT: 10.98 min Scan# 528
Delta R.T. 0.01 min
Lab File: RGV081.D
Acq: 4 Aug 2005 9:51 am

Tgt Ion: 78 Resp: 4793348
Ion Ratio Lower Upper
78 100
77 23.4 0.0 53.6
52 14.0 0.0 45.1



Abundance Ion 78.00 (77.70 to 78.70): RGV081.D
Ion 77.00 (76.70 to 77.70): RGV081.D
Ion 52.00 (51.70 to 52.70): RGV081.D



2928

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05G174

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Nine (9) water samples were received on 07/22/05 for Total Petroleum Hydrocarbons by Purge and Trap analysis by Method 5030B/M8015 in accordance with SW846 3rd Edition.

1. **Holding Time**

Analytical holding time was met. Water samples were preserved.

2. **Calibration**

Initial calibration was seven points. %RSD was within 20%. Continuing calibrations were carried out within 12-hour intervals and at the end of the analysis sequence. All recoveries were within 85-115%.

3. **Method Blank**

Method blanks were free of contamination at the reporting limit.

4. **Surrogate Recovery**

Surrogate recoveries were within QC limits except for sample G174-07 due to matrix interference. However, TFT, an alternate surrogate, was within QC limits.

5. **Lab Control Sample/Lab Control Sample Duplicate**

All recoveries were within QC limits.

6. **Matrix Spike/Matrix Spike Duplicate**

Sample G174-05 was spiked. All recoveries were within QC limits

7. **Sample Analysis**

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Results were quantified from C₆ to C₁₀ using GRO (C₆ - C₁₀) calibration factor.



LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : TETRA TECH EC, INC
Project : UST SITE 14, WFA, CTO 86
SDG NO. : 05G174
Instrument ID : GCT039

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
MBLK1W	VA39G198	1	NA	07/29/0505:04	07/29/0505:04	EG28031A	EG28029A	VA39G19	Method Blank
LCS1W	VA39G19L	1	NA	07/29/0505:40	07/29/0505:40	EG28032A	EG28029A	VA39G19	Lab Control Sample (LCS)
LCD1W	VA39G19C	1	NA	07/29/0506:16	07/29/0506:16	EG28033A	EG28029A	VA39G19	LCS Duplicate
MBLK2W	VA39G20B	1	NA	07/30/0513:07	07/30/0513:07	EG28076A	EG28071A	VA39G20	Method Blank
LCS2W	VA39G20L	1	NA	07/30/0513:43	07/30/0513:43	EG28077A	EG28071A	VA39G20	Lab Control Sample (LCS)
LCD2W	VA39G20C	1	NA	07/30/0514:19	07/30/0514:19	EG28078A	EG28071A	VA39G20	LCS Duplicate
86-S14-053	G174-01	1	NA	07/29/0506:52	07/29/0506:52	EG28034A	EG28029A	VA39G19	Field Sample
86-S14-059	G174-02	1	NA	07/29/0507:28	07/29/0507:28	EG28035A	EG28029A	VA39G19	Field Sample
86-S14-060	G174-03	1	NA	07/29/0508:04	07/29/0508:04	EG28036A	EG28029A	VA39G19	Field Sample
86-S14-062	G174-04	1	NA	07/29/0508:39	07/29/0508:39	EG28037A	EG28029A	VA39G19	Field Sample
86-S14-055	G174-05T	5	NA	07/29/0509:16	07/29/0509:16	EG28038A	EG28029A	VA39G19	Diluted Sample
86-S14-056	G174-06	1	NA	07/29/0511:05	07/29/0511:05	EG28041A	EG28029A	VA39G19	Field Sample
86-S14-057	G174-07	1	NA	07/29/0511:41	07/29/0511:41	EG28042A	EG28029A	VA39G19	Field Sample
86-S14-058	G174-08T	5	NA	07/30/0519:45	07/30/0519:45	EG28087A	EG28084A	VA39G20	Diluted Sample
86-S14-058	G174-09T	5	NA	07/30/0520:21	07/30/0520:21	EG28088A	EG28084A	VA39G20	Diluted Sample
86-S14-061MS	G174-05M	5	NA	07/29/0509:52	07/29/0509:52	EG28039A	EG28029A	VA39G19	Matrix Spike Sample (MS)
86-S14-061MSD	G174-05S	5	NA	07/29/0510:28	07/29/0510:28	EG28040A	EG28029A	VA39G19	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 07/29/05 06:52
Sample ID:   86-S14-053                     Date Analyzed: 07/29/05 06:52
Lab Samp ID: G174-01                        Dilution Factor: 1
Lab File ID: EG28034A                       Matrix       : WATER
Ext Btch ID: VA39G19                         % Moisture    : NA
Calib. Ref.: EG28029A                       Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	102	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.   : 05G174                      Date Extracted: 07/29/05 07:28
Sample ID   : 86-S14-059                  Date Analyzed: 07/29/05 07:28
Lab Samp ID : G174-02                     Dilution Factor: 1
Lab File ID : EG28035A                    Matrix       : WATER ✓
Ext Btch ID : VA39619                     % Moisture    : NA
Calib. Ref. : EG28029A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	100	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.   : 05G174                       Date Extracted: 07/29/05 08:04
Sample ID   : B6-S14-060                   Date Analyzed: 07/29/05 08:04
Lab Samp ID : G174-03                       Dilution Factor: 1
Lab File ID : EG28036A                      Matrix       : WATER
Ext Btch ID : VA39G19                       % Moisture    : NA
Calib. Ref. : EG28029A                      Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	89	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.   : 05G174                      Date Extracted: 07/29/05 08:39
Sample ID   : 86-S14-062                  Date Analyzed: 07/29/05 08:39
Lab Samp ID : G174-04                     Dilution Factor: 1
Lab File ID : EG28037A                    Matrix       : WATER
Ext Btch ID : VA39G19                     % Moisture    : NA
Calib. Ref. : EG28029A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.023J	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	108	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/29/05 09:16
Sample ID   : 86-S14-061                 Date Analyzed: 07/29/05 09:16
Lab Samp ID : G174-05T                   Dilution Factor: 5
Lab File ID : EG28038A                   Matrix       : WATER
Ext Btch ID : VA39G19                     % Moisture    : NA
Calib. Ref. : EG28029A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.76	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	97	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.    : 05G174                      Date Extracted: 07/29/05 11:05
Sample ID    : 86-S14-055                  Date Analyzed: 07/29/05 11:05
Lab Samp ID  : G174-06                     Dilution Factor: 1
Lab File ID  : EG28041A                    Matrix       : WATER
Ext Btch ID  : VA39G19                     % Moisture    : NA
Calib. Ref.  : EG28029A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	GC LIMIT
BROMOFLUOROBENZENE	104	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 07/29/05 11:41
Sample ID    : 86-S14-056                   Date Analyzed: 07/29/05 11:41
Lab Samp ID  : G174-07                       Dilution Factor: 1
Lab File ID  : EG28042A                     Matrix       : WATER
Ext Btch ID  : VA39G19                       % Moisture    : NA
Calib. Ref.  : EG28029A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.29	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	155*	65-135

RL : Reporting Limit
(*): Out of QC limit due to matrix interference

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MPA, CTD 86     Date Received: 07/22/05
Batch No.    : 05G174                      Date Extracted: 07/30/05 19:45
Sample ID:   86-S14-057                    Date Analyzed: 07/30/05 19:45
Lab Samp ID: G174-08T                      Dilution Factor: 5
Lab File ID: EG28087A                     Matrix       : WATER
Ext Btch ID: VA39G20                      % Moisture    : NA
Calib. Ref.: EG28084A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	1.9	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	120	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 056174                     Date Extracted: 07/30/05 20:21
Sample ID   : 86-S14-058                 Date Analyzed: 07/30/05 20:21
Lab Samp ID : G174-09T                   Dilution Factor: 5
Lab File ID : EG28088A                   Matrix          : WATER
Ext Btch ID : VA39G20                     % Moisture      : NA
Calib. Ref. : EG28084A                   Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	2	.5	.1
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	114	65-135	

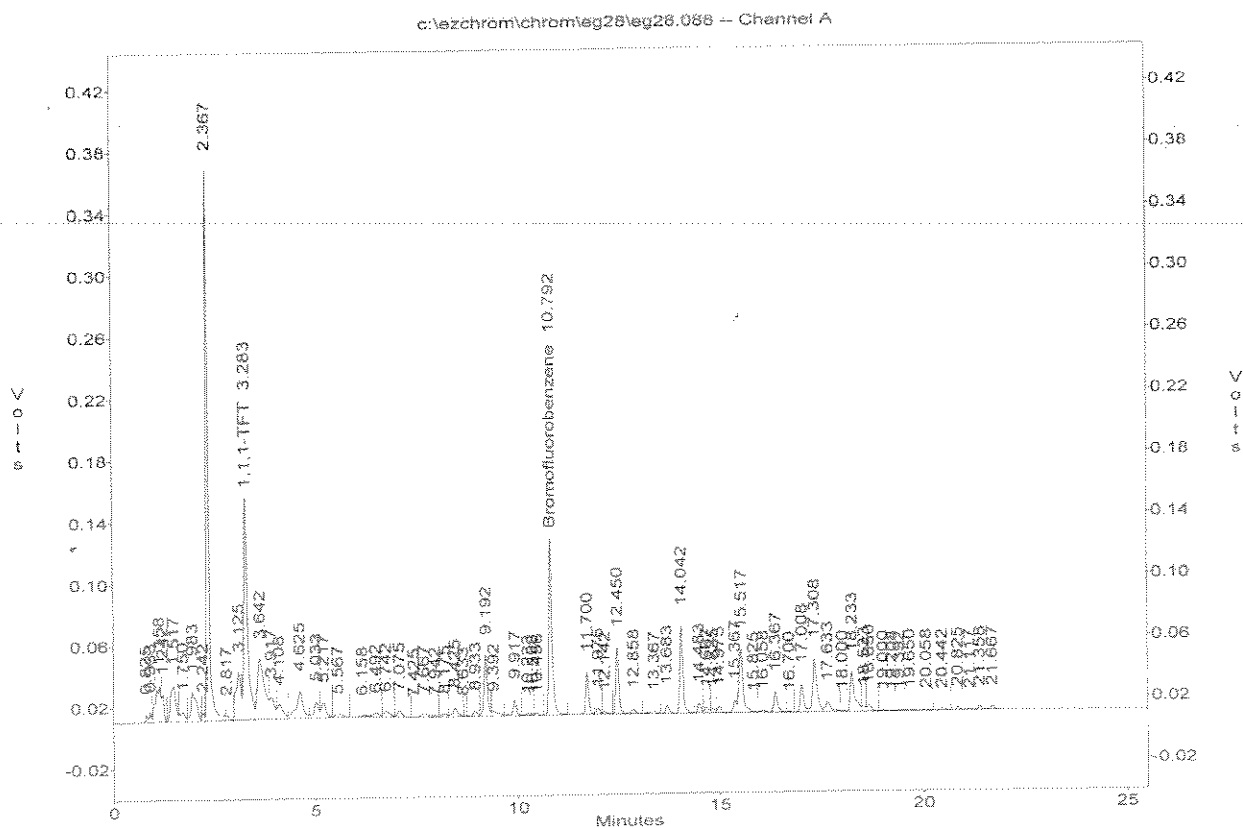
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\eg28\eg28.088
Method : c:\ezchrom\methods\vg39g06.met
Sample ID : 05G174-09T 1ML W *bf=5*
Acquired : Jul 30, 2005 20:21:06
Printed : Jul 31, 2005 09:34:45
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
12	1,1,1-TFT	3.283	927146.0	20471.3	45.29
37	Bromofluorobenzene	10.792	643047.0	14091.8	45.63
G1	GASOLINE(TOTAL)		6560559.0	14152.2	463.57
G2	GRO(C6-C10)		4321667.0	11044.7	391.29
G3	GRO(2MP-124TMB)		4534943.0	11128.2	407.52
G4	GRO(C5-C12)		6185361.0	13879.3	445.65



4013

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: July 21, 2005
LDC Report Date: August 29, 2005
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 05G174

Sample Identification

86-S14-053
86-S14-059
86-S14-060
86-S14-062
86-S14-061
86-S14-055
86-S14-056
86-S14-056DL
86-S14-057
86-S14-057DL
86-S14-058**
86-S14-058DL**
86-S14-061MS
86-S14-061MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all system performance check compounds (SPCCs) were within method criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

For the purposes of technical evaluation, all compounds were evaluated against the 20.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 20.0% for all compounds.

All of the continuing calibration RRF values for all system performance check compounds (SPCCs) were within method criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
86-S14-056 86-S14-057 86-S14-058**	Benzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 86-S14-057 and 86-S14-058** and samples 86-S14-057DL and 86-S14-058DL** were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	86-S14-057	86-S14-058**	
Benzene	92	95	3

Compound	Concentration (ug/L)		RPD
	86-S14-057DL	86-S14-058DL**	
Benzene	3000	3000	0

XVII. Field Blanks

Sample 86-S14-053 was identified as a trip blank. No volatile contaminants were found in this blank.

Moffett Airfield, UST Site 14, CTO 86
Volatiles - Data Qualification Summary - SDG 05G174

SDG	Sample	Compound	Flag	A or P	Reason
05G174	86-S14-056 86-S14-057 86-S14-058**	Benzene	J (all detects)	A	Compound quantitation and CRQLs

Moffett Airfield, UST Site 14, CTO 86
Volatiles - Laboratory Blank Data Qualification Summary - SDG 05G174

No Sample Data Qualified in this SDG

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 07/31/05 12:13
Sample ID: 86-S14-053                 Date Analyzed: 07/31/05 12:13
Lab Samp ID: G174-01                   Dilution Factor: 1
Lab File ID: RGV365                     Matrix          : WATER
Ext Btch ID: V001G32                   % Moisture       : NA
Calib. Ref.: RGV308                     Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	109	65-135
BROMOFLUOROBENZENE	120	75-125
TOLUENE-D8	113	75-125

RL: Reporting Limit

8/29/05

2004

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 07/31/05 12:50
Sample ID: 86-S14-059                 Date Analyzed: 07/31/05 12:50
Lab Samp ID: G174-02                   Dilution Factor: 1
Lab File ID: RGV366                     Matrix          : WATER
Ext Btch ID: V001G32                   % Moisture      : NA
Calib. Ref.: RGV308                     Instrument ID   : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-DB	99	75-125

RL: Reporting Limit

8/29/05

2005

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 07/31/05 13:28
Sample ID:   86-S14-060                     Date Analyzed: 07/31/05 13:28
Lab Samp ID: G174-03                        Dilution Factor: 1
Lab File ID: RGV367                         Matrix          : WATER
Ext Btch ID: V001G32                        % Moisture      : NA
Calib. Ref.: RGV308                         Instrument ID   : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

8/29/05

2006

SW 50308/82608
 VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 08/02/05 04:14
Sample ID:   86-S14-062               Date Analyzed: 08/02/05 04:14
Lab Samp ID: G174-04R                 Dilution Factor: 1
Lab File ID: RHV030                  Matrix       : WATER
Ext Btch ID: V001H02                 % Moisture    : NA
Calib. Ref.: RGV308                  Instrument ID: T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	92	65-135
BROMOFLUOROBENZENE	106	75-125
TOLUENE-D8	96	75-125

RL: Reporting Limit

8/29/05

2007

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC          Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTD 86    Date Received: 07/22/05
Batch No.    : 05G174                     Date Extracted: 08/02/05 09:18
Sample ID:   86-S14-061                   Date Analyzed: 08/02/05 09:18
Lab Samp ID: G174-05R                     Dilution Factor: 1
Lab File ID: RHV038                       Matrix          : WATER
Ext Btch ID: V001H02                       % Moisture       : NA
Calib. Ref.: RGV308                       Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	95	65-135
BROMOFLUOROBENZENE	112	75-125
TOLUENE-D8	106	75-125

RL: Reporting Limit

2008

8/29/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86      Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 07/31/05 15:22
Sample ID    : 86-S14-055                   Date Analyzed: 07/31/05 15:22
Lab Smp ID   : G174-06                      Dilution Factor: 1
Lab File ID  : RGV370                       Matrix          : WATER
Ext Btch ID  : V001G32                     % Moisture      : NA
Calib. Ref.  : RGV308                      Instrument ID   : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

8/29/05

2009

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 07/31/05 16:00
Sample ID    : 86-S14-056             Date Analyzed: 07/31/05 16:00
Lab Samp ID  : G174-07                 Dilution Factor: 1
Lab File ID  : RGV371                 Matrix          : WATER
Ext Btch ID  : V001G32                % Moisture      : NA
Calib. Ref.  : RGV308                 Instrument ID   : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	98E J	1	.2
TOLUENE	7.4	1	.2
ETHYLBENZENE	1	1	.2
XYLENES (TOTAL)	15	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	119	65-135
BROMOFLUOROBENZENE	114	75-125
TOLUENE-DB	104	75-125

RL: Reporting Limit

8/29/05

2010

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 08/02/05 04:52
Sample ID    : 86-S14-0560L           Date Analyzed: 08/02/05 04:52
Lab Samp ID  : G174-07T                Dilution Factor: 10
Lab File ID  : RHV031                  Matrix       : WATER
Ext Btch ID  : V001H02                 % Moisture   : NA
Calib. Ref.  : RGV308                  Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	88	10	2
TOLUENE	6.1J	10	2
ETHYLBENZENE	ND	10	2
XYLENES (TOTAL)	9.9J	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	92	65-135
BROMOFLUOROBENZENE	101	75-125
TOLUENE-D8	102	75-125

RL: Reporting Limit

2011

8/29/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.    : 05G174                 Date Extracted: 07/31/05 16:38
Sample ID    : 86-S14-057             Date Analyzed: 07/31/05 16:38
Lab Samp ID  : G174-08                Dilution Factor: 1
Lab File ID  : RGV372                 Matrix          : WATER
Ext Btch ID  : V001G32                % Moisture       : NA
Calib. Ref.  : RGV308                 Instrument ID    : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	92E J	1	.2
TOLUENE	10	1	.2
ETHYLBENZENE	2.7	1	.2
XYLENES (TOTAL)	41	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	111	65-135
BROMOFLUOROBENZENE	112	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

8/29/05

2012

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 08/04/05 09:14
Sample ID   : 86-S14-057DL           Date Analyzed: 08/04/05 09:14
Lab Samp ID : G174-081               Dilution Factor: 100
Lab File ID : RHV080                 Matrix          : WATER
Ext Btch ID : V001H05                % Moisture       : NA
Calib. Ref. : RGV308                Instrument ID    : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	3000	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	112	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

8/29/05

2013

SW 50308/8260B
VOLATILE ORGANICS BY GC/MS

```
=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                  Date Extracted: 07/31/05 17:16
Sample ID   : 86-S14-058              Date Analyzed: 07/31/05 17:16
Lab Smp ID  : G174-09                  Dilution Factor: 1
Lab File ID : RGV373                   Matrix          : WATER
Ext Btch ID : V001G32                  % Moisture       : NA
Calib. Ref. : RGV308                   Instrument ID    : T-001
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	95E J	1	.2
TOLUENE	11	1	.2
ETHYLBENZENE	2.8	1	.2
XYLENES (TOTAL)	41	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	113	65-135
BROMOFLUOROBENZENE	115	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

8/29/05

2014

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86      Date Received: 07/22/05
Batch No.    : 05G174                       Date Extracted: 08/04/05 09:51
Sample ID    : 86-S14-058DL                 Date Analyzed: 08/04/05 09:51
Lab Samp ID  : G174-091                     Dilution Factor: 100
Lab File ID  : RHV081                       Matrix       : WATER
Ext Btch ID  : V001H05                      % Moisture    : NA
Calib. Ref.  : RGV308                       Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	3000	100	20
TOLUENE	ND	100	20
ETHYLBENZENE	ND	100	20
XYLENES (TOTAL)	ND	300	50
MTBE	ND	100	20

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	103	75-125
TOLUENE-D8	98	75-125

RL: Reporting Limit

Handwritten signature/initials

LDC #: 13903A1
 SDG #: 05G174
 Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/29/05
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 7/21/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	NO SPCC RRP
IV.	Continuing calibration	A	ccv/icv ≤ 20 ↓
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS ID
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation. NOT reported
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 9, 11 D ₁ = 10, 12
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	86-S14-053	TB	11	86-S14-058**	D	21	86-S14-059	31
2	86-S14-059		12	86-S14-058DL**	D ₁ 100%	22	86-S14-060	32
3	86-S14-060		13	86-S14-061MS		23	86-S14-062	33
4	86-S14-062		14	86-S14-061MSD		24	86-S14-061	34
5	86-S14-061		15			25	86-S14-055	35
6	86-S14-055		16			26	86-S14-056	36
7	86-S14-056		17			27	86-S14-056DL 10%	37
8	86-S14-056DL 10%		18			28	86-S14-057	38
9	86-S14-057	D	19			29	86-S14-057DL D ₁ 100%	39
10	86-S14-057DL	D ₁ 100%	20			30		40

LDC #: 13903A1
SDG #: 059174

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: AB
2nd Reviewer: AK

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990 ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were all percent relative standard deviations (%RSD) $\leq 30\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) $\leq 25\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 13903A
SDG #: 059174

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: FJ
2nd Reviewer: R

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl chloride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Methyl ethyl ketone	FFF. 1,3-Dichlorobenzene	XXX. Di-isopropyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropane	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCC. 1-Chlorohexane
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromomethane	LLL. Hexachlorobutadiene	DDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFF. Acrolein
M. 2-Butanone	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	III. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorobutene	RRR. m,p-Xylenes	JJJ. Methacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLL. LLL.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".		
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	Y	N/A
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	Y	N/A

[illegible]

Comments: See sample calculation verification worksheet for recalculations

LDC #: 13903A1
SDG #: 059174

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A
Y N N/A

Were field duplicate pairs identified in this SDG?
Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD
	9	11	
✓	98	95	3

Compound	Concentration (ug/L)		RPD
	10	12	
✓	3000	3000	0

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 13903A/
SDG #: 056174

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_s)(C_s)/(A_u)(C_u)$
average RRF = sum of the RRFs/number of standards
%RSD = $100 * (S/X)$

A_s = Area of compound,
 C_s = Concentration of compound,
 S = Standard deviation of the RRFs
 X = Mean of the RRFs

A_u = Area of associated internal standard
 C_u = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (10 std)	RRF (10 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	V001629	7/29/05	Methylene chloride (1st internal standard)	0.417	0.417	0.402	0.402	11.55	11.55
			Trichlorethene (2nd internal standard)	1.806	1.806	1.787	1.787	7.35	7.35
			Toluene (3rd internal standard)						
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13903A
 SDG #: 059174

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: PS
 2nd Reviewer: PS

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$

$$\text{RRF} = (A_x)(C_s) / (A_s)(C_x)$$

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound,
 C_x = Concentration of compound,
 A_s = Area of associated internal standard
 C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	RCN359	7/31/05	Methylene chloride (1st internal standard)	0.402	0.464	15	0.464	15
			Trichlorethene (2nd internal standard)	1.787	1.899	6	1.899	6
			Toluene (3rd internal standard)					
2	RHV065	8/3/05	Methylene chloride (1st internal standard)	↓	0.368	8	0.368	8
			Trichlorethene (2nd internal standard)	↓	1.765	1	1.765	1
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13903A
SDG #: 056174

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 61

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	9.77	98	98	0
Bromofluorobenzene	↓	11.47	115	115	↓
1,2-Dichloroethane-d4		11.32	113	113	
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 13903A1
SDG #: 059174

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 12
2nd Reviewer: 28

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = $100 * (SSC - SC) / SA$ Where: SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added

RPD = $1 MSC - MSDC 1 * 2 / (MSC + MSDC)$ MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 13 + 14

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene											
Trichloroethene											
Benzene	10	10	100	10.2	10.6	102	102	106	106	4	4
Toluene	10	10	↓	10.4	10.8	104	104	108	108	4	4
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: 17
2nd Reviewer: 9

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

Where: SSC = Spiked sample concentration
SA = Spike added

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LOS | D VA 39919

[illegible]

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A

MS VOA (EPA SW 846 Method 8260B)
Were all reported results recalculated and verified for all level IV samples?
If not, list the detected target compounds agree within 10%.

Y	N	N/A
---	---	-----

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_s)(L)(DF)}{(A_r)(RRF)(V_o)(\%S)}$$

Example:

Sample I.D. 11, Toluene

Conc. = (2687180) (10) ()

(1385974 (1.838)) () ()

$$= 11 \mu\text{g/L}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_s = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

[illegible]

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: July 21, 2005
LDC Report Date: August 29, 2005
Matrix: Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 05G174

Sample Identification

86-S14-053
86-S14-059
86-S14-060
86-S14-062
86-S14-061
86-S14-055
86-S14-056
86-S14-057
86-S14-058**
86-S14-061MS
86-S14-061MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 20.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 86-S14-057 and 86-S14-058** were identified as field duplicates. No total petroleum hydrocarbons as gasoline were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	86-S14-057	86-S14-058**	
TPH as gasoline	1.9	2	5

X. Field Blanks

Sample 86-S14-053 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

Moffett Airfield, UST Site 14, CTO 86

Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 05G174

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, CTO 86

Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 05G174

No Sample Data Qualified in this SDG

METHOD 5030B/M8015
 TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC          Date Collected: 07/21/05
Project      : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.    : 05G174                     Date Extracted: 07/29/05 06:52
Sample ID    : 86-S14-053                 Date Analyzed: 07/29/05 06:52
Lab Samp ID  : G174-01                    Dilution Factor: 1
Lab File ID  : EG28034A                   Matrix       : WATER
Ext Btch ID  : VA39G19                     % Moisture    : NA
Calib. Ref.  : EG28029A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	102	65-135	

RL : Reporting Limit

8/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO B6     Date Received: 07/22/05
Batch No.   : 05G174                       Date Extracted: 07/29/05 07:28
Sample ID   : 86-S14-059                   Date Analyzed: 07/29/05 07:28
Lab Samp ID : G174-02                       Dilution Factor: 1
Lab File ID : EG28035A                      Matrix       : WATER
Ext Btch ID : VA39G19                       % Moisture    : NA
Calib. Ref. : EG28029A                      Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	100	65-135

RL : Reporting Limit

8/29/05

4005

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/29/05 08:04
Sample ID   : 86-S14-060                 Date Analyzed: 07/29/05 08:04
Lab Samp ID : G174-03                     Dilution Factor: 1
Lab File ID : EG28036A                    Matrix       : WATER
Ext Btch ID : VA39G19                     % Moisture    : NA
Calib. Ref. : EG28029A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	89	65-135	

RL : Reporting Limit

8/29/05

METHOD 50308/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 07/29/05 08:39
Sample ID: 86-S14-062                Date Analyzed: 07/29/05 08:39
Lab Samp ID: G174-04                  Dilution Factor: 1
Lab File ID: EG28037A                 Matrix       : WATER
Ext Btch ID: VA39G19                  % Moisture    : NA
Calib. Ref.: EG28029A                 Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.023J	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	108	65-135	

RL : Reporting Limit

8/29/05

4907

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/29/05 09:16
Sample ID   : 86-S14-061                 Date Analyzed: 07/29/05 09:16
Lab Samp ID : G174-05T                   Dilution Factor: 5
Lab File ID : EG28038A                   Matrix          : WATER
Ext Btch ID : VA39G19                     % Moisture       : NA
Calib. Ref. : EG28029A                   Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.76	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	97	65-135

RL : Reporting Limit

8/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/29/05 11:05
Sample ID   : 86-S14-055                 Date Analyzed: 07/29/05 11:05
Lab Samp ID : G174-06                    Dilution Factor: 1
Lab File ID : EG28041A                   Matrix          : WATER
Ext Btch ID : VA39G19                     % Moisture       : NA
Calib. Ref. : EG28029A                   Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	104	65-135

RL : Reporting Limit

8/29/05

4003

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/29/05 11:41
Sample ID: 86-S14-056                    Date Analyzed: 07/29/05 11:41
Lab Samp ID: G174-07                      Dilution Factor: 1
Lab File ID: EG28042A                     Matrix       : WATER
Ext Btch ID: VA39G19                      % Moisture    : NA
Calib. Ref.: EG28029A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.29	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	155*	65-135

RL : Reporting Limit

(*): Out of QC limit due to matrix interference

8/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 07/22/05
Batch No.   : 05G174                 Date Extracted: 07/30/05 19:45
Sample ID   : 86-S14-057             Date Analyzed: 07/30/05 19:45
Lab Samp ID : G174-08T               Dilution Factor: 5
Lab File ID : EG28087A              Matrix       : WATER
Ext Btch ID : VA39G20               % Moisture    : NA
Calib. Ref. : EG28084A              Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	1.9	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	120	65-135

RL : Reporting Limit

8/29/05

4011

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 07/21/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 07/22/05
Batch No.   : 05G174                     Date Extracted: 07/30/05 20:21
Sample ID   : 86-S14-058                 Date Analyzed: 07/30/05 20:21
Lab Samp ID : G174-09T                   Dilution Factor: 5
Lab File ID : EG28088A                   Matrix       : WATER
Ext Btch ID : VA39G20                     % Moisture    : NA
Calib. Ref. : EG28084A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	2	.5	.1

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	114	65-135

RL : Reporting Limit

Handwritten signature/initials

LDC #: 13903A7

SDG #: 05G174

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 8/29/05

Page: 1 of 1

Reviewer: PZ

2nd Reviewer: PZ

METHOD: GC TPH as Gasoline (EPA SW846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 7/21/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	ICV ≤ 20
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS ID
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 8 + 9
X.	Field blanks	ND	TB = 1

Note: A = Acceptable

ND = No compounds detected

D = Duplicate

N = Not provided/applicable R = Rinsate

TB = Trip blank

SW = See worksheet

FB = Field blank

EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation *Water*

1	86-S14-053	TB	11	86-S14-061MSD	21	VA 39G19	31	
2	86-S14-059		12		22	VA 39G20	32	
3	86-S14-060		13		23		33	
4	86-S14-062		14		24		34	
5	86-S14-061		15		25		35	
6	86-S14-055		16		26		36	
7	86-S14-056		17		27		37	
8	86-S14-057	D	18		28		38	
9	86-S14-058**	D	19		29		39	
10	86-S14-061MS		20		30		40	

Notes:

LDC #: 13903A7
SDG #: 05G174

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

Method: ☒ GC ☐ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____ %D or %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 13903A7
SDG #: 05G174

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: AF
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound Identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field duplicates?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Were field blanks identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 13902A7
SDG #: 05G174

METHOD: ☒ GC ☐ HPLC

☒ Y ☐ N ☐ N/A Were field duplicate pairs identified in this SDG?

☒ Y ☐ N ☐ N/A Were target compounds detected in the field duplicate pairs?

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

Compound	Concentration (<u>mg/L</u>)		%RPD Limit	Qualification Parent only / All Samples
	8	9		
<u>paroxetine</u>	<u>1.9</u>	<u>2</u>	<u>5</u>	

Compound	Concentration ()		%RPD Limit	Qualification Parent only / All Samples

LDC #: 12903A7
SDG #: 059174

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = $100 \cdot (S/X)$
A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				CF (500 µg)	CF (500 µg)	Average CF (initial)	Average CF (initial)	%RSD	%RSD
1	902 26-010	7/6/05 DB-5	gasoline	10365	10365	11044.7	11044.7	7.0	7.0
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

LDC #: 12803A7
SDG #: 059174

METHOD: GC HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 \cdot (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
CF = A/C CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	EG28084A	7/30/05	ginseng C ₆ -C ₁₀	500	449.55	10	449.55	10
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13903A7
SDG #: 054174

METHOD: GC HPLC

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: RE
2nd reviewer:

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
BFB	DB-5	40	45.63	114	114	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 1390347
SDG #: 059174

Page: 1 of 1
 Reviewer: FP
 2nd Reviewer: JS

METHOD: GC HPLC

Were all reported results recalculated and verified for all level IV samples?

$$\text{Concentration} = \frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$$

Example:

Sample ID.	#9	Compound Name	jasconine
------------	----	---------------	-----------

Concentration = 4321667×5

11044.7 Cool

7/26/21

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor

RF= Average response factor of the compound

In the initial calibration

V_s = Initial volume of the sample

Ws= Initial weight of the sample

%S= Percent Solid

[illegible]

Comments:



TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER **10841**
CHAIN-OF-CUSTODY RECORD

PROJECT NAME S14-05/0		PURCHASE ORDER NO 205413 10-8-05		ANALYSES REQUIRED										LABORATORY NAME L. 6304 X		Project Information Section Do not submit to Laboratory								
PROJECT LOCATION M (64)		PROJECT NO 1990 0360												LABORATORY ID (FOR LABORATORY)										
SAMPLER NAME S. Hansen		AIRBILL NUMBER 851128684008												COMMENTS 051114		LOCATION Trap Black		DEPTH START END		QC				
PROJECT CONTACT C. Hansen		PROJECT CONTACT PHONE NUMBER 760/756 1360												COMMENTS										
SAMPLE ID		DATE COLLECTED	TIME COLLECTED	NO OF CONTAINER	LEVEL 3 4	T Y P E	T A T											LOCATION		DEPTH		QC		
86-S14-05/0		1/1/05	1500	6	X	W	W	W											W14-3				S	
86-S14-05/0		1/1/05	1515	5	X	W	W	W											W14-3				S	
86-S14-05/0		1/1/05	1525	5	X	W	W	W											W14-3				S	
86-S14-05/0		1/1/05	0812	8	X	W	W	W											W14-12				S	
86-S14-05/0		1/1/05	0700	6	X	W	W	W											W14-11				S	
86-S14-05/0		1/1/05	1000	9	X	W	W	W											ERM-2				S	
86-S14-05/0		1/1/05	1600	8	X	W	W	W											W14-13				S	
RELINQUISHED BY (Signature)		DATE	RECEIVED BY (Signature)											LABORATORY INSTRUCTIONS/COMMENTS		SAMPLING COMMENT: Site 14 G.W. R3/05								
COMPANY		TIME	COMPANY																					
RELINQUISHED BY (Signature)		DATE	RECEIVED BY (Signature)											COMPOSITE DESCRIPTION										
COMPANY		TIME	COMPANY																					
RELINQUISHED BY (Signature)		DATE	RECEIVED BY (Signature)											SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)										
COMPANY		TIME	COMPANY											TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN										

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management



NUMBER 10842

CHAIN-OF-CUSTODY RECORD

[illegible]

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05J114

**SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS**

Eleven (11) water samples were received on 10/19/05 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

M/P-xylenes in J114-05 was manually reintegrated to correct for improper integration. Chromatograms of before and after manual integration were kept on file for review.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTD 86

SDG NO. : 05J114
Instrument ID : T-005

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
MBLK1W	V005J58Q	1	NA	10/22/0519:55	10/22/0519:55	RJ0718	R10499	V005J58	Method Blank
LCS1W	V005J58L	1	NA	10/22/0518:03	10/22/0518:03	RJ0715	R10499	V005J58	Lab Control Sample (LCS)
LCD1W	V005J58C	1	NA	10/22/0518:40	10/22/0518:40	RJ0716	R10499	V005J58	LCS Duplicate
86-S14-063	J114-01	1	NA	10/22/0520:33	10/22/0520:33	RJ0719	R10499	V005J58	Field Sample
86-S14-064	J114-08	1	NA	10/22/0521:10	10/22/0521:10	RJ0720	R10499	V005J58	Field Sample
86-S14-065	J114-06	1	NA	10/22/0521:47	10/22/0521:47	RJ0721	R10499	V005J58	Field Sample
86-S14-070	J114-07	1	NA	10/22/0522:24	10/22/0522:24	RJ0722	R10499	V005J58	Field Sample
86-S14-068	J114-11	1	NA	10/22/0523:01	10/22/0523:01	RJ0723	R10499	V005J58	Field Sample
86-S14-069	J114-02	1	NA	10/22/0523:38	10/22/0523:38	RJ0724	R10499	V005J58	Field Sample
86-S14-072	J114-03	1	NA	10/23/0500:15	10/23/0500:15	RJ0725	R10499	V005J58	Field Sample
86-S14-066	J114-04	1	NA	10/23/0500:53	10/23/0500:53	RJ0726	R10499	V005J58	Field Sample
86-S14-071	J114-10	1	NA	10/23/0501:30	10/23/0501:30	RJ0727	R10499	V005J58	Field Sample
MBLK2W	V005J59Q	1	NA	10/23/0502:07	10/23/0502:07	RJ0728	R10499	V005J58	Field Sample
LCS2W	V005J59L	1	NA	10/24/0512:30	10/24/0512:30	RJ0740	R10499	V005J59	Method Blank
LCD2W	V005J59C	1	NA	10/24/0510:40	10/24/0510:40	RJ0737	R10499	V005J59	Lab Control Sample (LCS)
86-S14-067	J114-09T	10	NA	10/24/0511:16	10/24/0511:16	RJ0738	R10499	V005J59	LCS Duplicate
86-S14-067DL	J114-09I	250	NA	10/24/0513:45	10/24/0513:45	RJ0742	R10499	V005J59	Diluted Sample
MBLK3W	V005J61Q	1	NA	10/24/0515:55	10/24/0515:55	RJ0745	R10499	V005J59	Diluted Sample
LCS3W	V005J61L	1	NA	10/26/0515:12	10/26/0515:12	RJ0779	R10499	V005J61	Method Blank
LCD3W	V005J61C	1	NA	10/26/0513:20	10/26/0513:20	RJ0776	R10499	V005J61	Lab Control Sample (LCS)
86-S14-066DL	J114-10T	10	NA	10/26/0513:57	10/26/0513:57	RJ0777	R10499	V005J61	LCS Duplicate
				10/26/0515:49	10/26/0515:49	RJ0780	R10499	V005J61	Diluted Sample

FN - Filename
% Moist - Percent Moisture

2002

SAMPLE RESULTS

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 10/17/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.    : 05J114                 Date Extracted: 10/22/05 20:33
Sample ID:   86-S14-063                Date Analyzed: 10/22/05 20:33
Lab Samp ID: J114-01                   Dilution Factor: 1
Lab File ID: RJQ719                     Matrix       : WATER
Ext Stch ID: V005J58                     % Moisture    : NA
Calib. Ref.: RIQ499                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/22/05 23:38
Sample ID: 86-S14-068                     Date Analyzed: 10/22/05 23:38
Lab Samp ID: J114-02                      Dilution Factor: 1
Lab File ID: RJ0724                      Matrix       : WATER
Ext Btch ID: V005J58                     % Moisture    : NA
Calib. Ref.: RI0499                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 10/17/05
Project      : UST SITE 14, MFA, CTO B6 Date Received: 10/19/05
Batch No.    : 05J114                 Date Extracted: 10/23/05 00:15
Sample ID    : B6-S14-069             Date Analyzed: 10/23/05 00:15
Lab Samp ID  : J114-03                 Dilution Factor: 1
Lab File ID  : RJQ725                  Matrix          : WATER
Ext Btch ID  : V005J58                 % Moisture       : NA
Calib. Ref.  : RIQ499                  Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	119	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	100	75-125

RL: Reporting Limit

Quantitation Report (QT Reviewed)

Data File : D:\HPCHEM\1\DATA\05J21\RJQ725.D

Acq On : 23 Oct 2005 12:15 am

Sample : 05J114-03 25mL

Misc : DF=1

MS Integration Params: 524TAIL.P

Quant Time: Oct 25 11:34 2005

Vial: 15

Operator: CGM

Inst : TO05

Multiplr: 1.00

Quant Results File: VO05I21.RES

Quant Method : D:\HPCHEM\1\METHODS\VO05I21.M (RTE Integrator)

Title : METHOD 8260

Last Update : Wed Oct 12 09:23:17 2005

Response via : Initial Calibration

DataAcq Meth : VO05I21

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	8.65	114	1634554	10.00	ug/l	0.01
37) CHLOROBENZENE-D5	14.56	117	4345963	10.00	ug/l	0.00
68) 1,2-DICHLOROBENZENE-D4	20.85	152	468824	10.00	ug/l	0.00
System Monitoring Compounds						
36) 1,2-Dichloroethane-d4	7.94	65	453351	11.87	ug/l	0.00
Spiked Amount	10.000		Recovery	=	118.70%	
50) Toluene-d8	11.45	98	1668177	9.95	ug/l	0.01
Spiked Amount	10.000		Recovery	=	99.50%	
72) 4-Bromofluorobenzene	17.28	95	538968	10.79	ug/l	0.00
Spiked Amount	10.000		Recovery	=	107.90%	
Target Compounds						
12) 1,1-Dichloroethene	3.86	61	51322	0.56	ug/l	95
23) 1,1-Dichloroethane	5.58	63	114653	1.14	ug/l	98
28) cis-1,2-Dichloroethene	6.50	61	112827	1.36	ug/l	96

(#) = qualifier out of range (m) = manual integration
RJQ725.D VO05I21.M Tue Oct 25 11:34:16 2005

2007 1

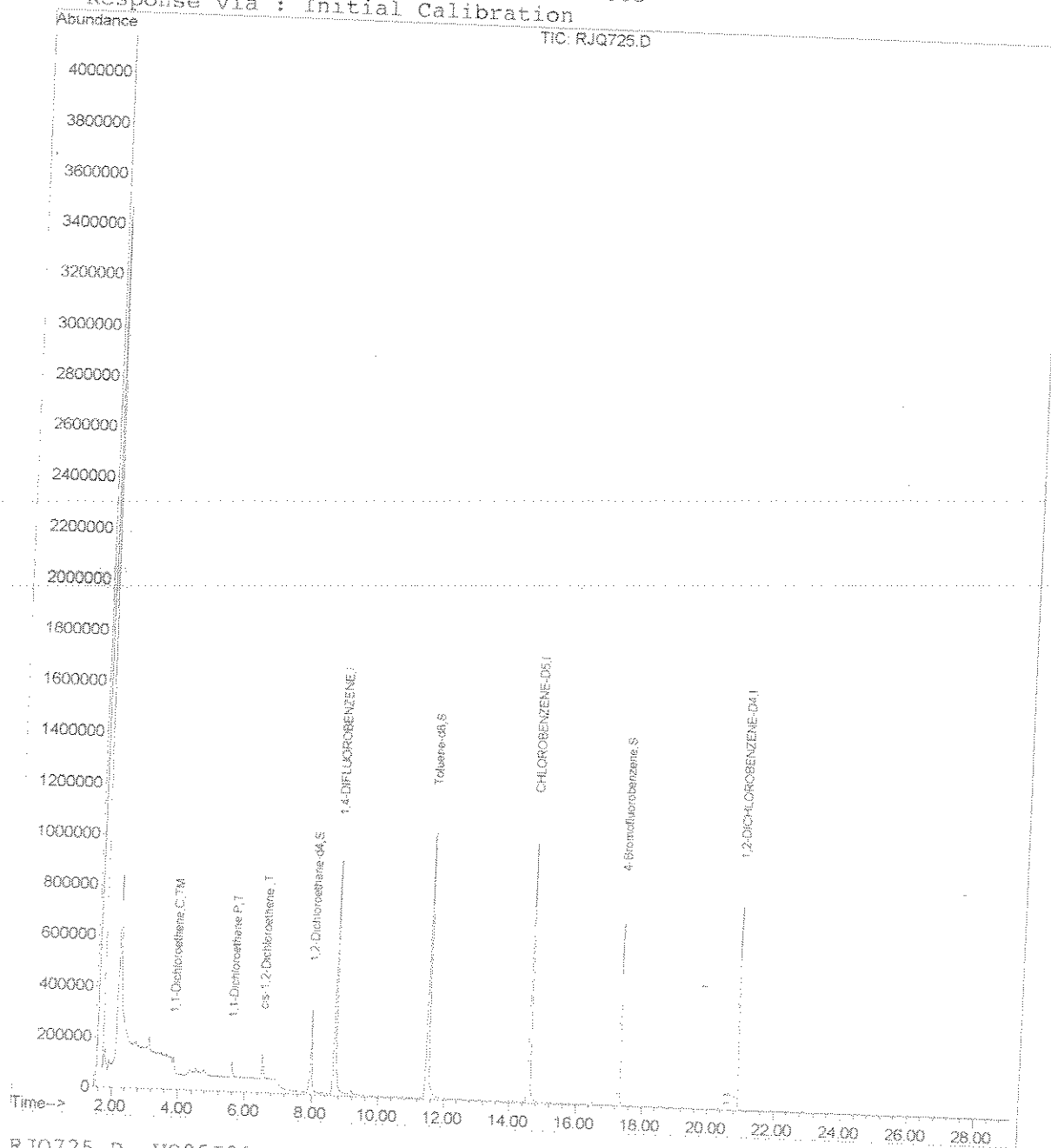
Quantitation Report

Data File : D:\HPCHEM\1\DATA\05J21\RJQ725.D
Acq On : 23 Oct 2005 12:15 am
Sample : 05J114-03 25mL
Misc : DF=1
MS Integration Params: 524TAIL.P
Quant Time: Oct 25 11:34 2005

Vial: 15
Operator: CGM
Inst : T005
Multiplr: 1.00

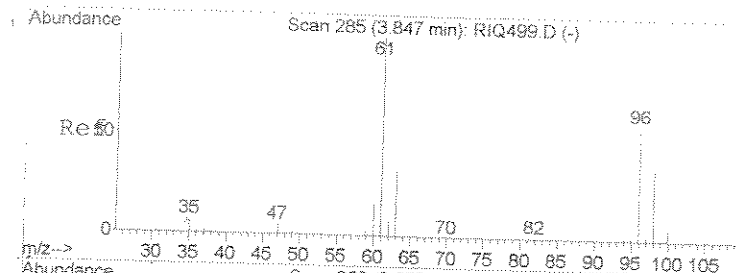
Quant Results File: VO05I21.RE

Method : D:\HPCHEM\1\METHODS\VO05I21.M (RTE Integrator)
Title : METHOD 8260
Last Update : Wed Oct 12 09:23:17 2005
Response via : Initial Calibration

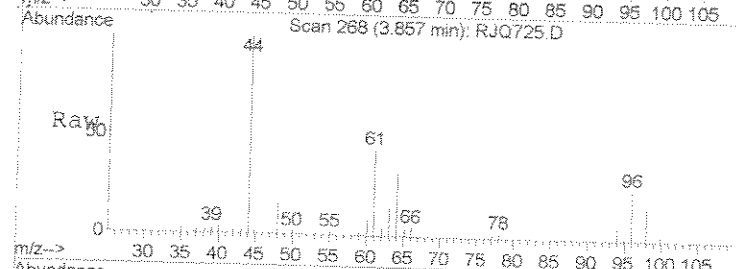


RJQ725.D VO05I21.M

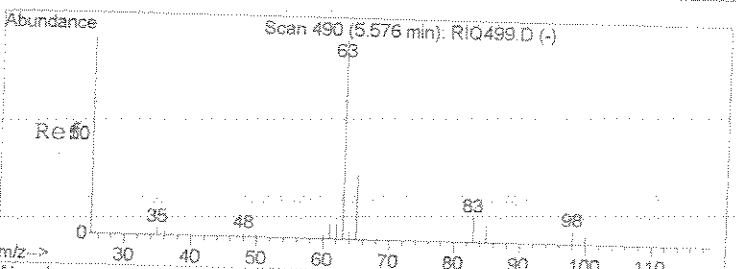
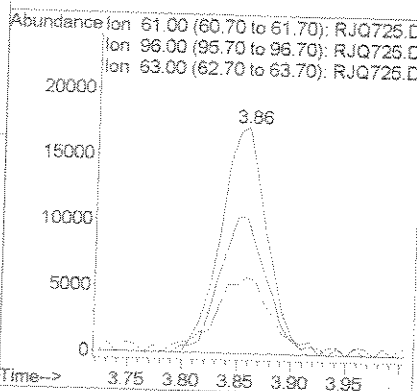
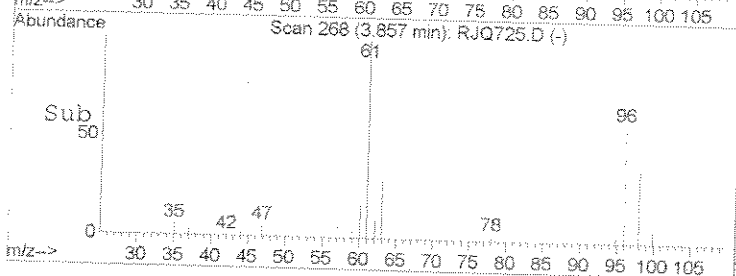
Tue Oct 25 11:34:17 2005



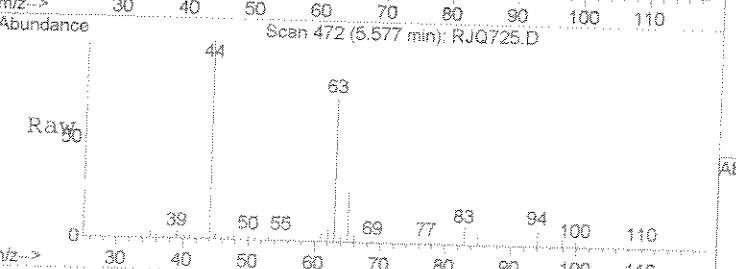
#12
1,1-Dichloroethene
Concen: 0.56 ug/l
RT: 3.86 min Scan# 268
Delta R.T. 0.01 min
Lab File: RJQ725.D
Acq: 23 Oct 2005 12:15 am



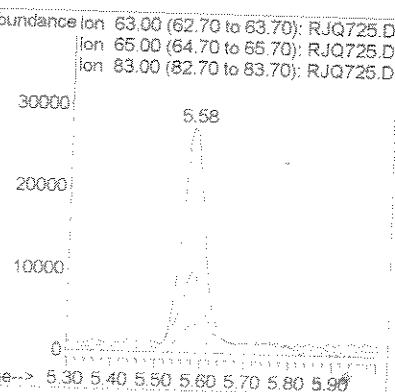
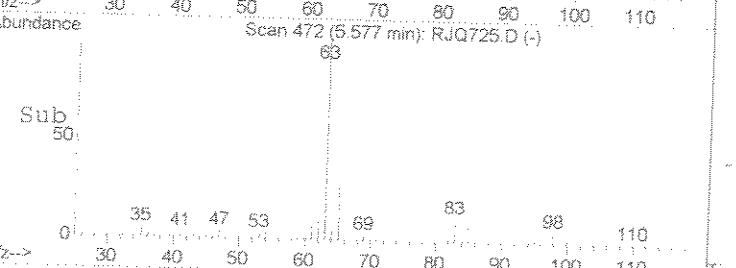
Tgt Ion: 61 Resp: 51322
Ion Ratio Lower Upper
61 100
96 61.3 31.0 91.0
63 41.4 3.0 63.0

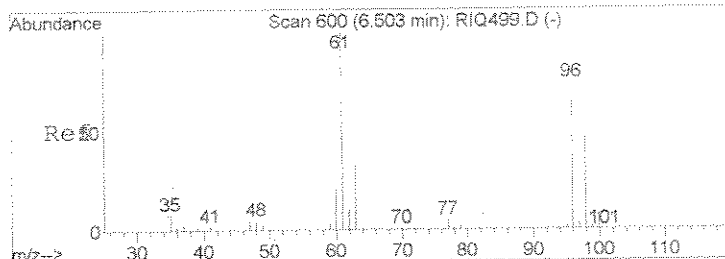


#23
1,1-Dichloroethane
Concen: 1.14 ug/l
RT: 5.58 min Scan# 472
Delta R.T. 0.00 min
Lab File: RJQ725.D
Acq: 23 Oct 2005 12:15 am



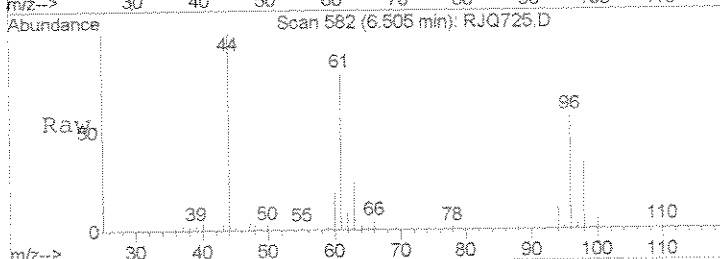
Tgt Ion: 63 Resp: 114653
Ion Ratio Lower Upper
63 100
65 32.9 2.3 62.3
83 11.2 0.0 43.5



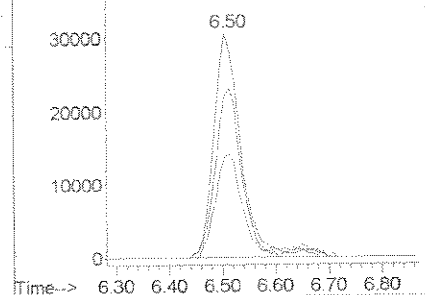
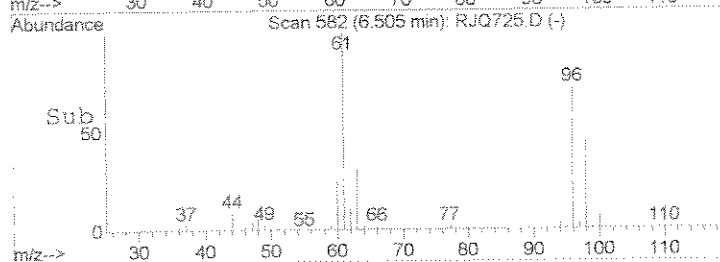


#28
cis-1,2-Dichloroethene
Concen: 1.36 ug/l
RT: 6.50 min Scan# 582
Delta R.T. 0.00 min
Lab File: RJQ725.D
Acq: 23 Oct 2005 12:15 am

Tgt Ion: 61 Resp: 112827
Ion Ratio Lower Upper
61 100
96 75.5 40.2 100.2
98 44.3 15.1 75.1



Abundance Ion 61.00 (60.70 to 61.70): RJQ725.D
Ion 96.00 (95.70 to 96.70): RJQ725.D
Ion 98.00 (97.70 to 98.70): RJQ725.D



SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/23/05 00:53
Sample ID    : B6-S14-072                  Date Analyzed: 10/23/05 00:53
Lab Samp ID  : J114-04                      Dilution Factor: 1
Lab File ID  : RJQ726                       Matrix       : WATER
Ext Btch ID  : V005J58                     % Moisture   : NA
Calib. Ref.  : RIQ499                      Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	114	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/23/05 02:07
Sample ID   : 86-S14-071             Date Analyzed: 10/23/05 02:07
Lab Samp ID : J114-05                 Dilution Factor: 1
Lab File ID : RJQ728                 Matrix       : WATER
Ext Btch ID : V005J58                 % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	.71J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	113	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.    : 05J114                 Date Extracted: 10/22/05 21:47
Sample ID:   86-S14-065               Date Analyzed: 10/22/05 21:47
Lab Samp ID: J114-06                  Dilution Factor: 1
Lab File ID: RJ0721                   Matrix           : WATER
Ext Stch ID: V005J58                  % Moisture       : NA
Calib. Ref.: RIQ499                   Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/22/05 22:24
Sample ID:   86-S14-073                     Date Analyzed: 10/22/05 22:24
Lab Samp ID: J114-07                         Dilution Factor: 1
Lab File ID: RJQ722                         Matrix          : WATER
Ext Btch ID: V005J58                       % Moisture       : NA
Calib. Ref.: RIQ499                       Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	117	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 06     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/22/05 21:10
Sample ID    : 86-S14-064                   Date Analyzed: 10/22/05 21:10
Lab Samp ID  : J114-08                       Dilution Factor: 1
Lab File ID  : RJQ720                         Matrix       : WATER
Ext Btch ID  : V005J58                       % Moisture    : NA
Calib. Ref.  : RIQ499                         Instrument ID : I-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                      Date Extracted: 10/24/05 13:45
Sample ID:   86-S14-067                    Date Analyzed: 10/24/05 13:45
Lab Samp ID: J114-09T                      Dilution Factor: 10
Lab File ID: RJQ742                        Matrix          : WATER
Ext Btch ID: V005J59                       % Moisture       : NA
Calib. Ref.: RIQ499                        Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	550E	10	2
TOLUENE	43	10	2
ETHYLBENZENE	43	10	2
XYLENES (TOTAL)	130	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	110	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                       Date Extracted: 10/24/05 15:55
Sample ID   : B6-S14-067DL                 Date Analyzed: 10/24/05 15:55
Lab Samp ID : J114-09I                      Dilution Factor: 250
Lab File ID : RJ0745                         Matrix       : WATER
Ext Btch ID : V005J59                       % Moisture    : NA
Calib. Ref. : RIQ499                        Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	8900	250	50
TOLUENE	60J	250	50
ETHYLBENZENE	65J	250	50
XYLENES (TOTAL)	260J	750	120
MTBE	ND	250	50

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/23/05 01:30
Sample ID    : B6-S14-066                   Date Analyzed: 10/23/05 01:30
Lab Samp ID  : J114-10                       Dilution Factor: 1
Lab File ID  : RJQ727                       Matrix          : WATER
Ext Btch ID  : V005J58                       % Moisture       : NA
Calib. Ref.  : RIQ499                       Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	50E	1	.2
TOLUENE	5.4	1	.2
ETHYLBENZENE	.52J	1	.2
XYLENES (TOTAL)	12	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	117	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-DB	105	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```
=====
Client       : TETRA TECH EC, INC      Date Collected: 10/18/05
Project      : UST SITE 14, MPA, CYO 86 Date Received: 10/19/05
Batch No.    : 05J114                 Date Extracted: 10/26/05 15:49
Sample ID    : 86-S14-0660L           Date Analyzed: 10/26/05 15:49
Lab Samp ID  : J114-10T                Dilution Factor: 10
Lab File ID  : RJQ780                  Matrix          : WATER
Ext Btch ID  : V005J61                 % Moisture       : NA
Calib. Ref.  : RIQ499                  Instrument ID    : T-005
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	62	10	2
TOLUENE	6.4J	10	2
ETHYLBENZENE	ND	10	2
XYLENES (TOTAL)	15J	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	102	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/22/05 23:01
Sample ID    : 86-S14-070                   Date Analyzed: 10/22/05 23:01
Lab. Samp ID: J114-11                       Dilution Factor: 1
Lab File ID  : RJG723                       Matrix          : WATER
Ext Btch ID  : V005J58                       % Moisture       : NA
Calib. Ref.  : RIQ499                       Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	118	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

QC SUMMARIES

2021

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: NA
Project      : UST SITE 14, MFA, CTO 86      Date Received: 10/22/05
Batch No.    : 05J114                       Date Extracted: 10/22/05 19:55
Sample ID    : MBLK1W                       Date Analyzed: 10/22/05 19:55
Lab Samp ID  : V005J58Q                     Dilution Factor: 1
Lab File ID  : RJQ718                       Matrix       : WATER
Ext Btch ID  : V005J58                       % Moisture    : NA
Calib. Ref.  : RIQ499                       Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
BATCH NO.: 05J114
METHOD: SW 5030B/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 % MOISTURE: NA
SAMPLE ID: MBLK1W
LAB SAMP ID: V005J58Q V005J58L V005J58C
LAB FILE ID: RJQ718 RJQ715 RJQ716
DATE EXTRACTED: 10/22/05 19:55 10/22/05 18:03 10/22/05 18:40 DATE COLLECTED: NA
DATE ANALYZED: 10/22/05 19:55 10/22/05 18:03 10/22/05 18:40 DATE RECEIVED: 10/22/05
PREP. BATCH: V005J58 V005J58 V005J58
CALIB. REF: RIQ499 RIQ499 RIQ499

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	10	10.8	108	10	10.9	109	1	75-125	20
Toluene	ND	10	11.5	115	10	11.6	116	1	70-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	11.6	116	10	11.5	115	65-135
Bromofluorobenzene	10	10.6	106	10	10.2	102	75-125
Toluene-d8	10	10.4	104	10	10.3	103	75-125

SW 5030B/B260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: NA
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/24/05
Batch No.    : 05J114                       Date Extracted: 10/24/05 12:30
Sample ID    : MBLK2W                       Date Analyzed: 10/24/05 12:30
Lab Samp ID  : V005J59Q                     Dilution Factor: 1
Lab File ID  : RJQ740                       Matrix          : WATER
Ext Btch ID  : V005J59                      % Moisture       : NA
Calib. Ref.  : RIQ499                       Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYL BENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	104	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
BATCH NO.: 05J114
METHOD: SW 5030B/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 1 % MOISTURE: NA
SAMPLE ID: MBLK2W
LAB SAMP ID: V005J59G V005J59L V005J59C
LAB FILE ID: RJQ740 RJQ737 RJQ738
DATE EXTRACTED: 10/24/0512:30 10/24/0510:40 10/24/0511:16 DATE COLLECTED: NA
DATE ANALYZED: 10/24/0512:30 10/24/0510:40 10/24/0511:16 DATE RECEIVED: 10/24/05
PREP. BATCH: V005J59 V005J59 V005J59
CALIB. REF: RIQ499 RIQ499 RIQ499

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	10	10.8	108	10	11.2	112	4	75-125	20
Toluene	ND	10	11.5	115	10	12	120	4	70-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	10.6	106	10	10.4	104	65-135
Bromofluorobenzene	10	10.5	105	10	10.4	104	75-125
Toluene-d8	10	10.3	103	10	10.4	104	75-125

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: NA
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/26/05
Batch No.    : 05J114                       Date Extracted: 10/26/05 15:12
Sample ID    : MBLK3W                       Date Analyzed: 10/26/05 15:12
Lab Samp ID  : V005J61Q                     Dilution Factor: 1
Lab File ID  : RJQ779                       Matrix       : WATER
Ext Btch ID  : V005J61                       % Moisture    : NA
Calib. Ref.  : RIQ499                       Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	117	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	102	75-125

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
BATCH NO.: 05J114
METHOD: SW 50308/82608

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK3W
LAB SAMP ID: V005J61Q V005J61L V005J61C
LAB FILE ID: RJQ779 RJQ776 RJQ777
DATE EXTRACTED: 10/26/0515:12 10/26/0513:20 10/26/0513:57 DATE COLLECTED: NA
DATE ANALYZED: 10/26/0515:12 10/26/0513:20 10/26/0513:57 DATE RECEIVED: 10/26/05
PREP. BATCH: V005J61 V005J61 V005J61
CALIB. REF: RIQ499 RIQ499 RIQ499

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Benzene	ND	10	10.9	109	10	10.5	105	3	75-125	20
Toluene	ND	10	11.7	117	10	11.3	113	4	70-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	11	110	10	11.6	116	65-135
Bromofluorobenzene	10	10.7	107	10	10.8	108	75-125
Toluene-d8	10	10.2	102	10	10.3	103	75-125

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05J114

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Eleven (11) water samples were received on 10/19/05 for Total Petroleum Hydrocarbons by Purge and Trap analysis by Method 5030B/M8015 in accordance with SW846 3rd Edition.

1. Holding Time

Analytical holding time was met. Water samples were preserved.

2. Calibration

Initial calibration was seven points. %RSD was within 20%. Continuing calibrations were carried out within 12-hour intervals and at the end of the analysis sequence. All recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at the reporting limit.

4. Surrogate Recovery

Surrogate recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Results were quantified from C₈ to C₁₀ using GRO (C₈ - C₁₀) calibration factor.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
SDG NO. : 05J114
Instrument ID : 6C7039

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
MBLK1W	VA39J13B	1	NA	10/21/0514:25	10/21/0514:25	EJ21003A	EJ21002A	VA39J13	Method Blank
LCS1W	VA39J13L	1	NA	10/21/0515:02	10/21/0515:02	EJ21004A	EJ21002A	VA39J13	Lab Control Sample (LCS)
LCD1W	VA39J13C	1	NA	10/21/0515:38	10/21/0515:38	EJ21005A	EJ21002A	VA39J13	LCS Duplicate
86-S14-063	J114-01	1	NA	10/21/0516:15	10/21/0516:15	EJ21006A	EJ21002A	VA39J13	Field Sample
86-S14-068	J114-02	1	NA	10/21/0516:51	10/21/0516:51	EJ21007A	EJ21002A	VA39J13	Field Sample
86-S14-069	J114-03	1	NA	10/21/0517:27	10/21/0517:27	EJ21008A	EJ21002A	VA39J13	Field Sample
86-S14-071	J114-04	1	NA	10/21/0518:03	10/21/0518:03	EJ21009A	EJ21002A	VA39J13	Field Sample
86-S14-065	J114-05	1	NA	10/21/0518:39	10/21/0518:39	EJ21010A	EJ21002A	VA39J13	Field Sample
86-S14-073	J114-06	1	NA	10/21/0519:15	10/21/0519:15	EJ21011A	EJ21002A	VA39J13	Field Sample
86-S14-064	J114-07	1	NA	10/21/0519:51	10/21/0519:51	EJ21012A	EJ21002A	VA39J13	Field Sample
86-S14-067	J114-08	1	NA	10/21/0521:39	10/21/0521:39	EJ21015A	EJ21013A	VA39J13	Field Sample
86-S14-066	J114-09T	10	NA	10/21/0522:15	10/21/0522:15	EJ21016A	EJ21013A	VA39J13	Diluted Sample
86-S14-070	J114-10	1	NA	10/21/0522:51	10/21/0522:51	EJ21017A	EJ21013A	VA39J13	Field Sample
	J114-11	1	NA	10/21/0523:27	10/21/0523:27	EJ21018A	EJ21013A	VA39J13	Field Sample

FN : Filename
% Moist - Percent Moisture

SAMPLE RESULTS

4003

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/17/05
Project      : UST SITE 14, MFA, CTO B6     Date Received: 10/19/05
Batch No.    : 05J114                      Date Extracted: 10/21/05 16:15
Sample ID:   B6-S14-063                   Date Analyzed: 10/21/05 16:15
Lab Samp ID: J114-01                      Dilution Factor: 1
Lab File ID: EJ21006A                     Matrix       : WATER
Ext Btch ID: VA39J13                      % Moisture    : NA
Calib. Ref.: EJ21002A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	87	65-135	

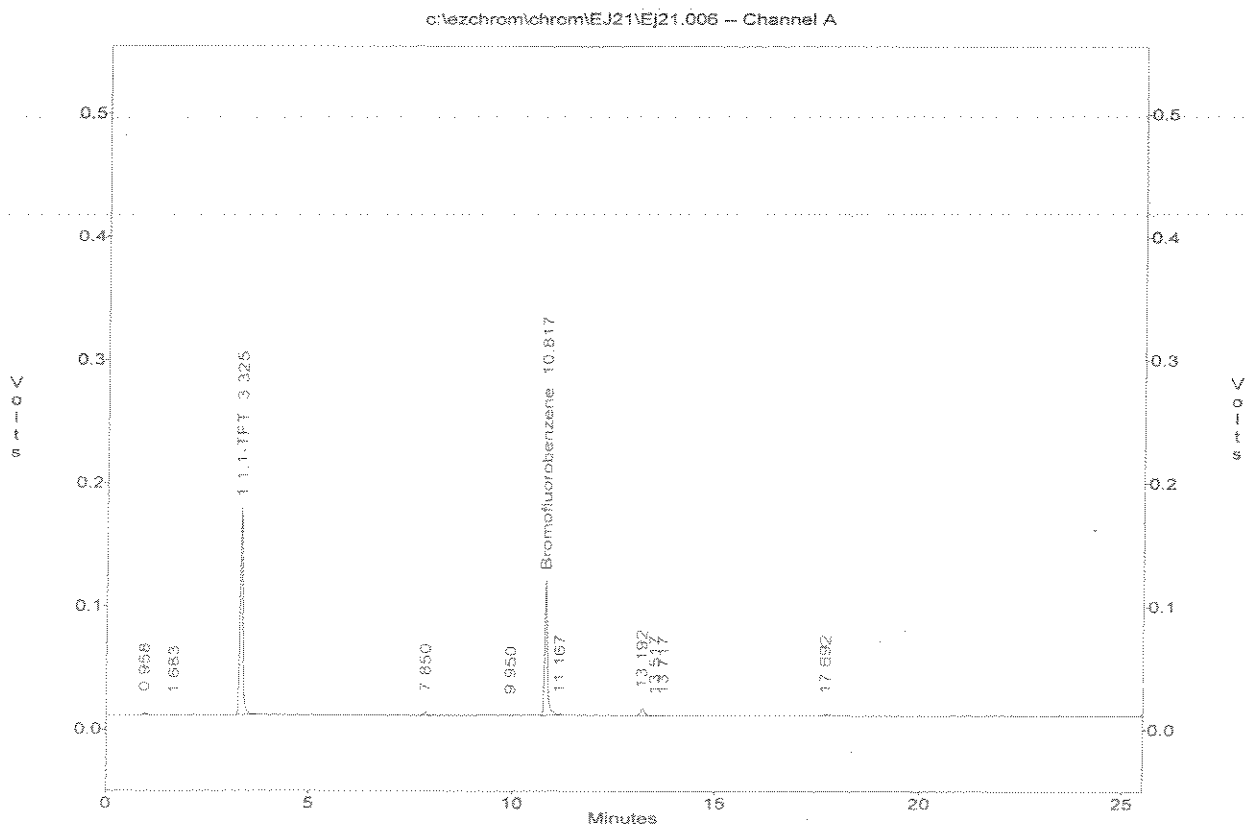
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EJ21\Ej21.006
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-01 5.0ML W
Acquired : Oct 21, 2005 16:15:03
Printed : Oct 21, 2005 16:40:36
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
3	1,1,1-TFT	3.325	839455.0	23201.8	36.18
6	Bromofluorobenzene	10.817	565470.0	16280.2	34.73
G1	GASOLINE(TOTAL)		85211.0	17610.5	4.84
G2	GRO(C6-C10)		28357.0	14372.0	1.97
G3	GRO(2MP-124TMB)		28357.0	14472.4	1.96
G4	GRO(C5-C12)		85211.0	17253.5	4.94



4005

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 16:51
Sample ID: 86-S14-068                     Date Analyzed: 10/21/05 16:51
Lab Samp ID: J114-02                      Dilution Factor: 1
Lab File ID: EJ21007A                    Matrix       : WATER
Ext Btch ID: VA39J13                     % Moisture    : NA
Calib. Ref.: EJ21002A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	84	65-135	

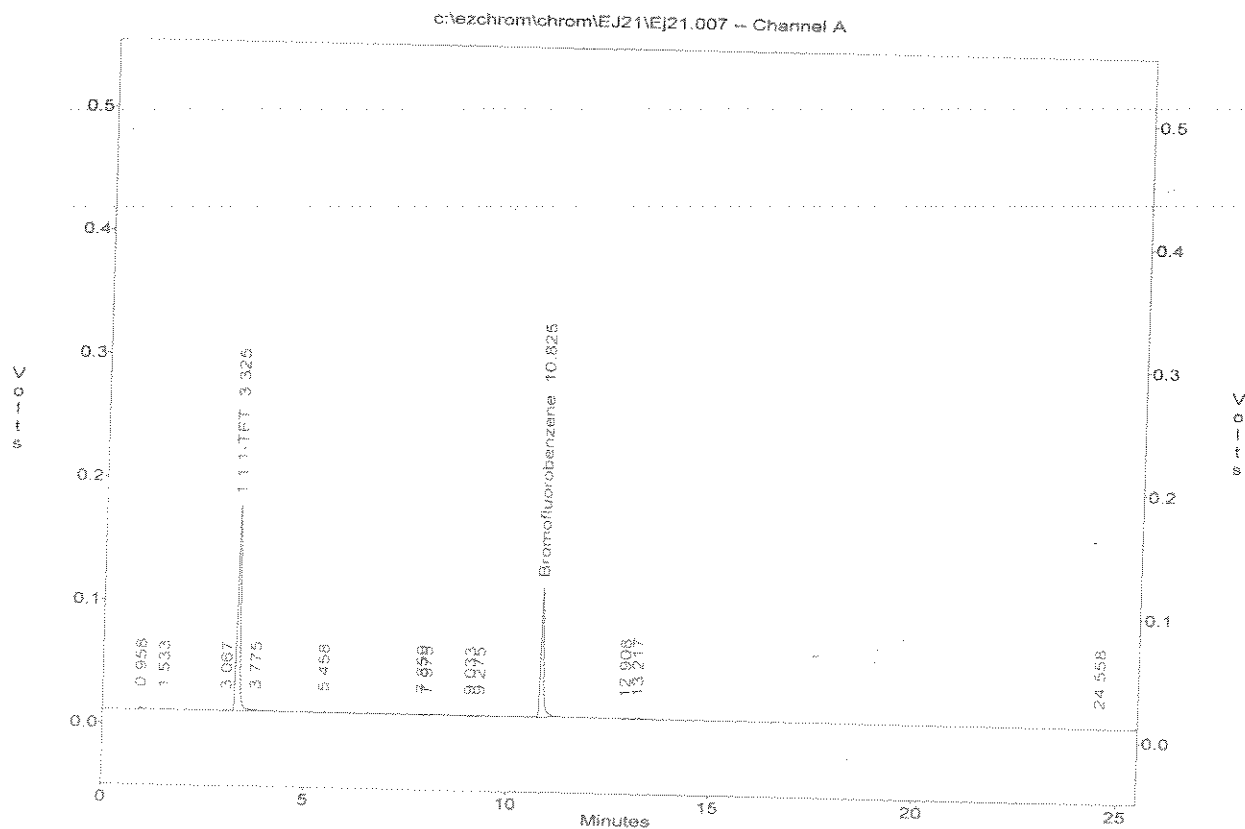
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EJ21\Ej21.007
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-02 5.0ML W
Acquired : Oct 21, 2005 16:51:15
Printed : Oct 21, 2005 17:16:47
User : SERGIO

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
4	1,1,1-TFT	3.325	841519.0	23201.8	36.27
11	Bromofluorobenzene	10.825	550129.0	16280.2	33.79
G1	GASOLINE (TOTAL)		48550.0	17610.5	2.76
G2	GRO (C6-C10)		24652.0	14372.0	1.72
G3	GRO (2MP-124TMB)		26967.0	14472.4	1.86
G4	GRO (C5-C12)		46102.0	17253.5	2.67



4007

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/21/05 17:27
Sample ID: 86-S14-069                    Date Analyzed: 10/21/05 17:27
Lab Samp ID: J114-03                     Dilution Factor: 1
Lab File ID: EJ21008A                    Matrix       : WATER
Ext Btch ID: VA39J13                     % Moisture    : NA
Calib. Ref.: EJ21002A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	87	65-135

RL : Reporting Limit

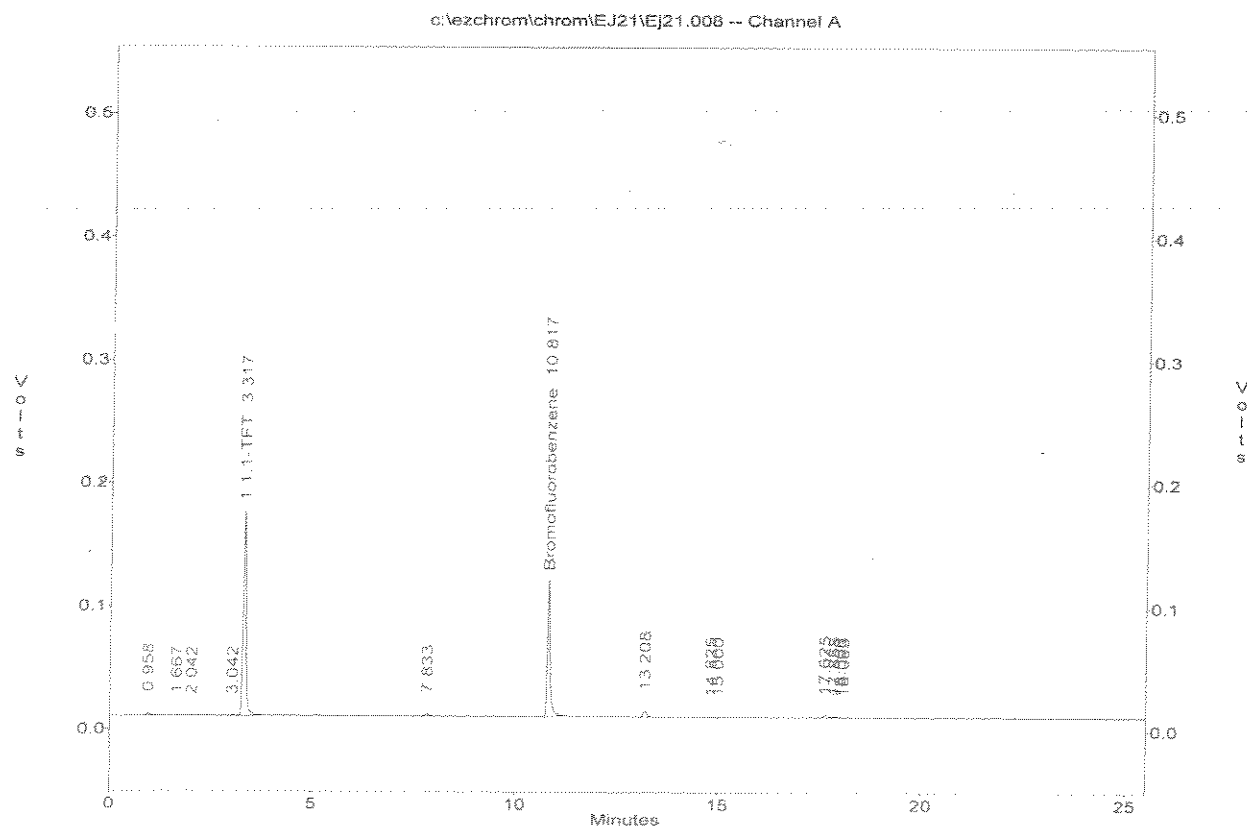
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.



File : c:\ezchrom\chrom\EJ21\Ej21.008
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-03 5.0ML W
Acquired : Oct 21, 2005 17:27:20
Printed : Oct 21, 2005 17:52:51
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
5	1,1,1-TFT	3.317	847991.0	23201.8	36.55
7	Bromofluorobenzene	10.817	565966.0	16280.2	34.76
G1	GASOLINE(TOTAL)		101089.0	17610.5	5.74
G2	GRO(C6-C10)		20914.0	14372.0	1.46
G3	GRO(2MP-124TMB)		22506.0	14472.4	1.56
G4	GRO(C5-C12)		101089.0	17253.5	5.86



4009

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP



```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 18:03
Sample ID: 86-S14-072                    Date Analyzed: 10/21/05 18:03
Lab Samp ID: J114-04                     Dilution Factor: 1
Lab File ID: EJ21009A                    Matrix      : WATER
Ext Btch ID: VA39J13                     % Moisture   : NA
Calib. Ref.: EJ21002A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.021J	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	92	65-135

RL : Reporting Limit

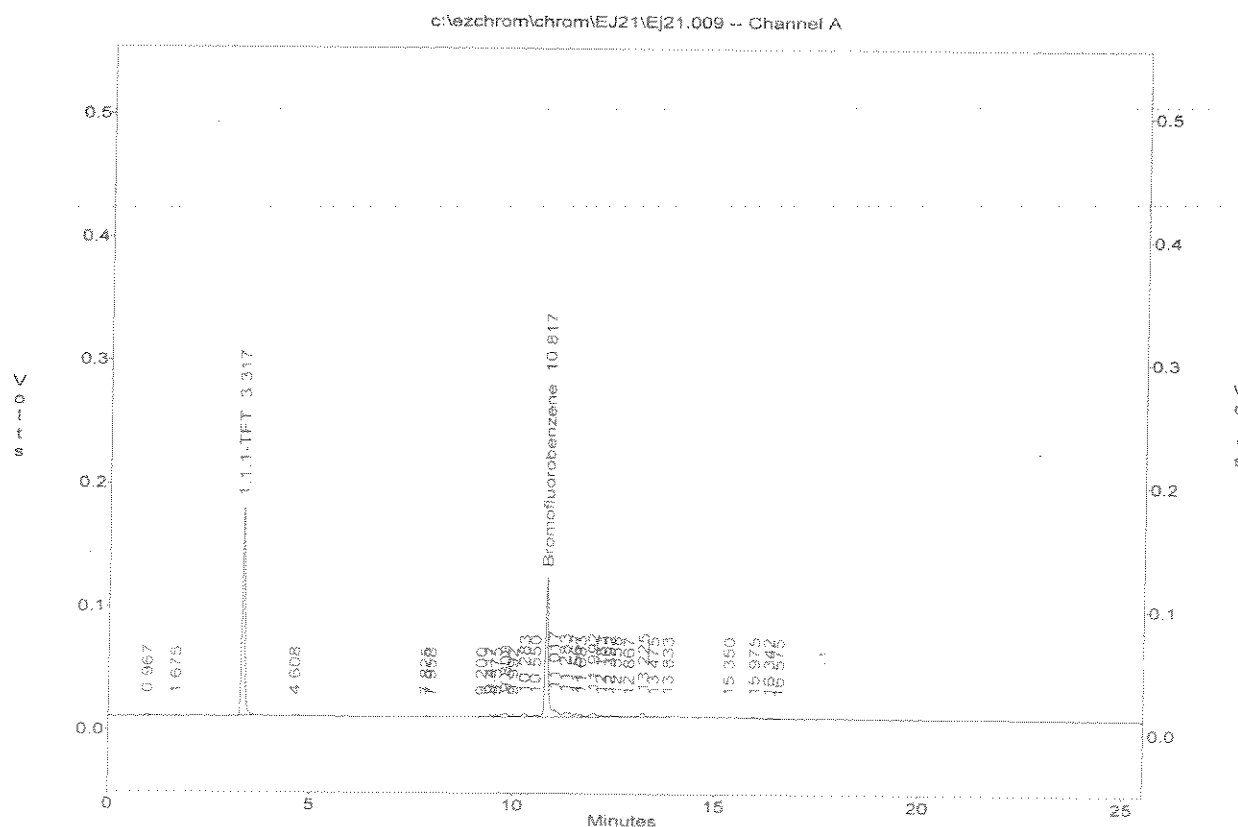
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

EMAX
LABORATORIES, INC.

File : c:\ezchrom\chrom\EJ21\Ej21.009
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-04 5.0ML W
Acquired : Oct 21, 2005 18:03:30
Printed : Oct 21, 2005 18:29:02
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
3	1,1,1-TFT	3.317	844642.0	23201.8	36.40
14	Bromofluorobenzene	10.817	598598.0	16280.2	36.77
G1	GASOLINE(TOTAL)		374023.0	17610.5	21.24
G2	GRO(C6-C10)		295541.0	14372.0	20.56
G3	GRO(2MP-124TMB)		298062.0	14472.4	20.60
G4	GRO(C5-C12)		374023.0	17253.5	21.68



4011

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/21/05 18:39
Sample ID: 86-S14-071                    Date Analyzed: 10/21/05 18:39
Lab Samp ID: J114-05                      Dilution Factor: 1
Lab File ID: EJ21010A                     Matrix       : WATER
Ext Btch ID: VA39J13                      % Moisture    : NA
Calib. Ref.: EJ21002A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.55	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	101	65-135

RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

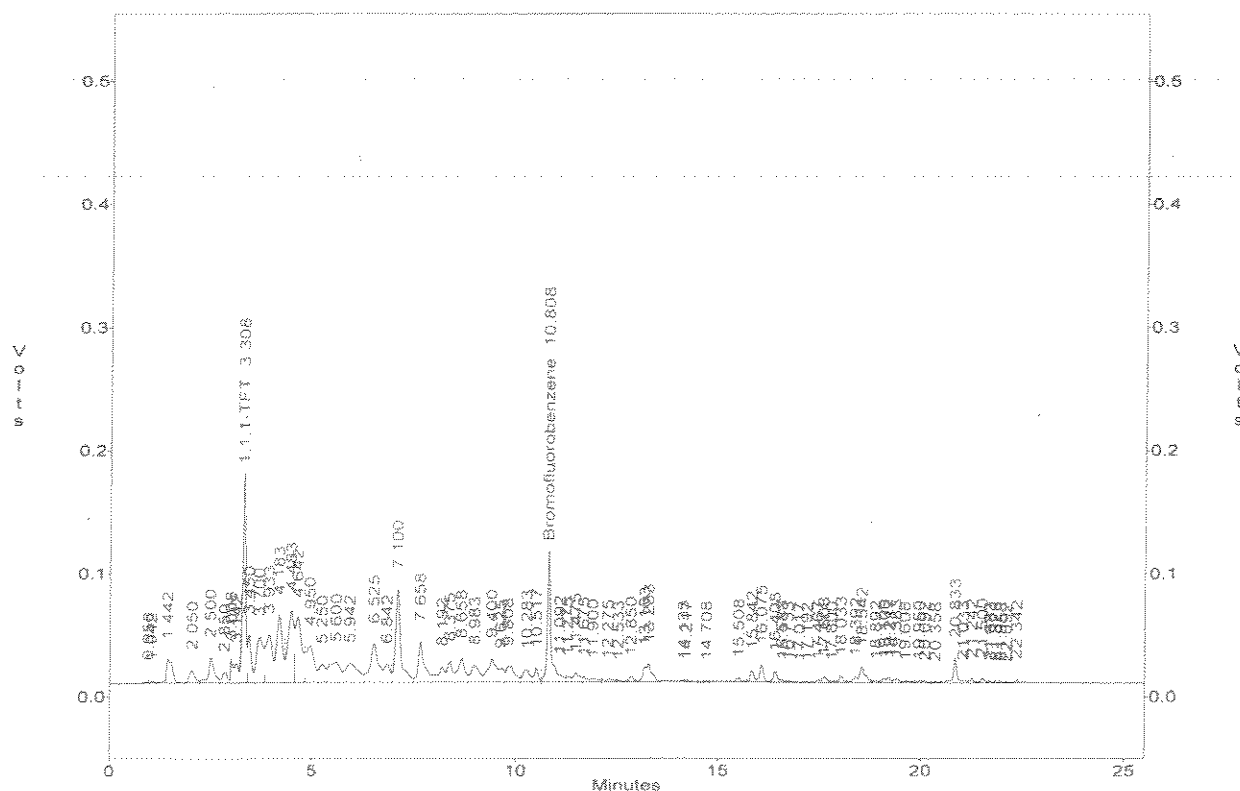


File : c:\ezchrom\chrom\EJ21\EJ21.010
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-05 5.0ML W
Acquired : Oct 21, 2005 18:39:34
Printed : Oct 21, 2005 19:05:07
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
9	1,1,1-TFT	3.308	883558.0	23201.8	38.08
33	Bromofluorobenzene	10.808	659334.0	16280.2	40.50
G1	GASOLINE(TOTAL)		9370573.0	17610.5	532.10
G2	GRO(C6-C10)		7953312.0	14372.0	553.39
G3	GRO(2MP-124TMB)		7953312.0	14472.4	549.55
G4	GRO(C5-C12)		8955576.0	17253.5	519.06

c:\ezchrom\chrom\EJ21\EJ21.010 -- Channel A



4013

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/21/05 19:15
Sample ID    : 86-S14-065                   Date Analyzed: 10/21/05 19:15
Lab Samp ID  : J114-06                       Dilution Factor: 1
Lab File ID  : EJ21011A                     Matrix          : WATER
Ext Btch ID  : VA39J13                      % Moisture       : NA
Calib. Ref.  : EJ21002A                     Instrument ID    : GCY039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	82	65-135	

RL : Reporting Limit

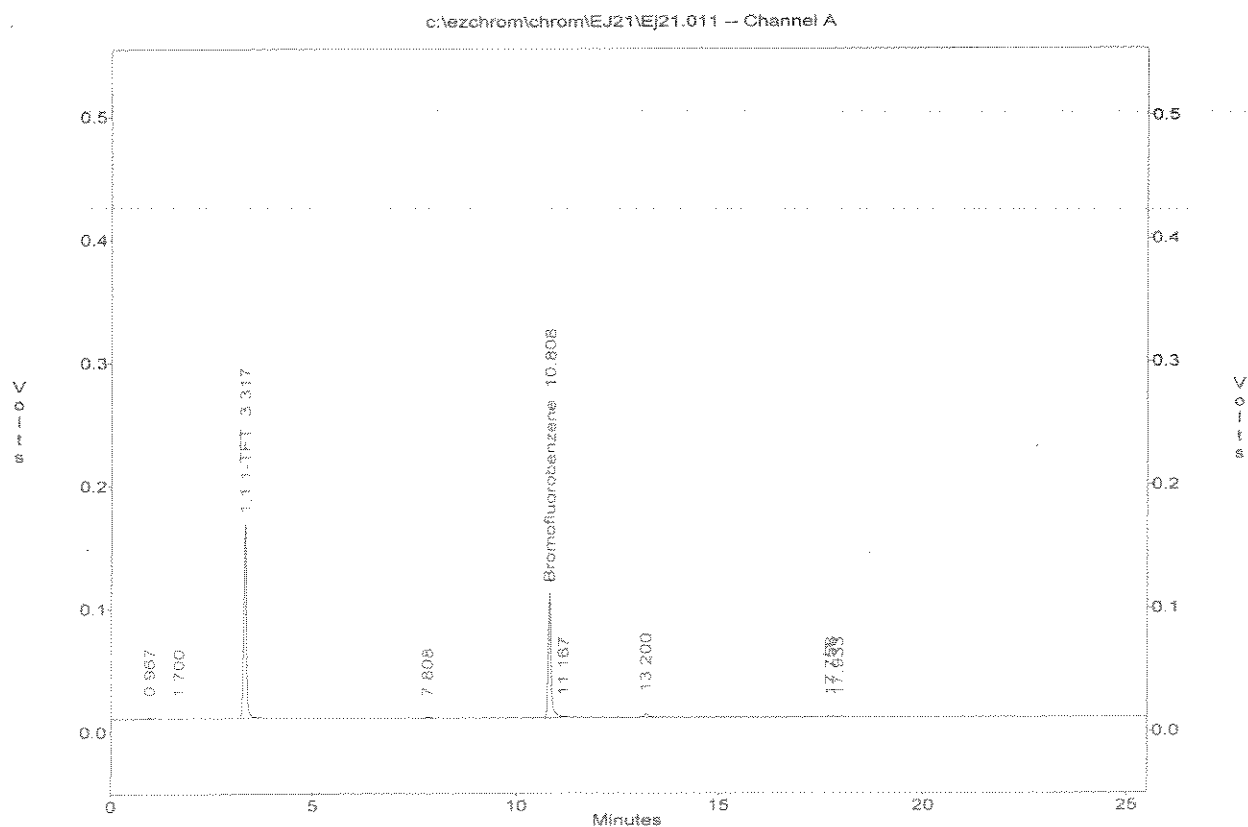
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.



File : c:\ezchrom\chrom\EJ21\Ej21.011
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-06 5.0ML W
Acquired : Oct 21, 2005 19:15:37
Printed : Oct 21, 2005 19:41:09
User : SERGIO

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
3	1,1,1-TFT	3.317	792682.0	23201.8	34.16
5	Bromofluorobenzene	10.808	532786.0	16280.2	32.73
G1	GASOLINE(TOTAL)		53751.0	17610.5	3.05
G2	GRO(C6-C10)		17187.0	14372.0	1.20
G3	GRO(2MP-124TMB)		17187.0	14472.4	1.19
G4	GRO(C5-C12)		53751.0	17253.5	3.12



4015

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/21/05 19:51
Sample ID   : 86-S14-073                 Date Analyzed: 10/21/05 19:51
Lab Samp ID : J114-07                    Dilution Factor: 1
Lab File ID : EJ21012A                   Matrix       : WATER
Ext Btch ID : VA39J13                    % Moisture    : NA
Calib. Ref. : EJ21002A                   Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	87	65-135

RL : Reporting Limit

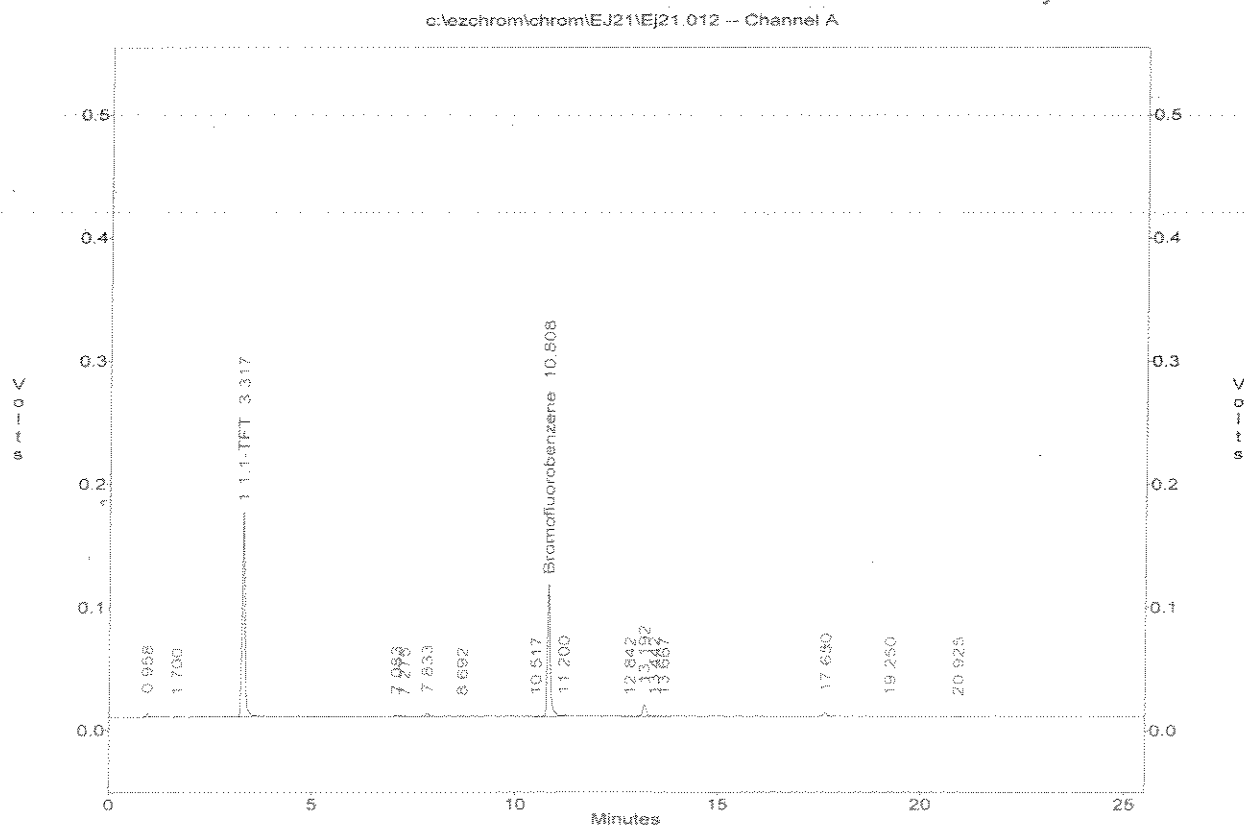
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

EMAX
LABORATORIES, INC.

File : c:\ezchrom\chrom\EJ21\Ej21.012
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-07 5.0ML W
Acquired : Oct 21, 2005 19:51:39
Printed : Oct 21, 2005 20:17:11
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
3	1,1,1-TFT	3.317	837503.0	23201.8	36.10
9	Bromofluorobenzene	10.808	567847.0	16280.2	34.88
G1	GASOLINE(TOTAL)		166459.0	17610.5	9.45
G2	GRO(C6-C10)		51711.0	14372.0	3.60
G3	GRO(2MP-124TMB)		51711.0	14472.4	3.57
G4	GRO(C5-C12)		157304.0	17253.5	9.12



4017

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC          Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.    : 05J114                     Date Extracted: 10/21/05 21:39
Sample ID    : 86-S14-064                 Date Analyzed: 10/21/05 21:39
Lab Samp ID  : J114-08                    Dilution Factor: 1
Lab File ID  : EJ21015A                   Matrix          : WATER
Ext Btch ID  : VA39J13                    % Moisture       : NA
Calib. Ref.  : EJ21013A                    Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	97	65-135

RL : Reporting Limit

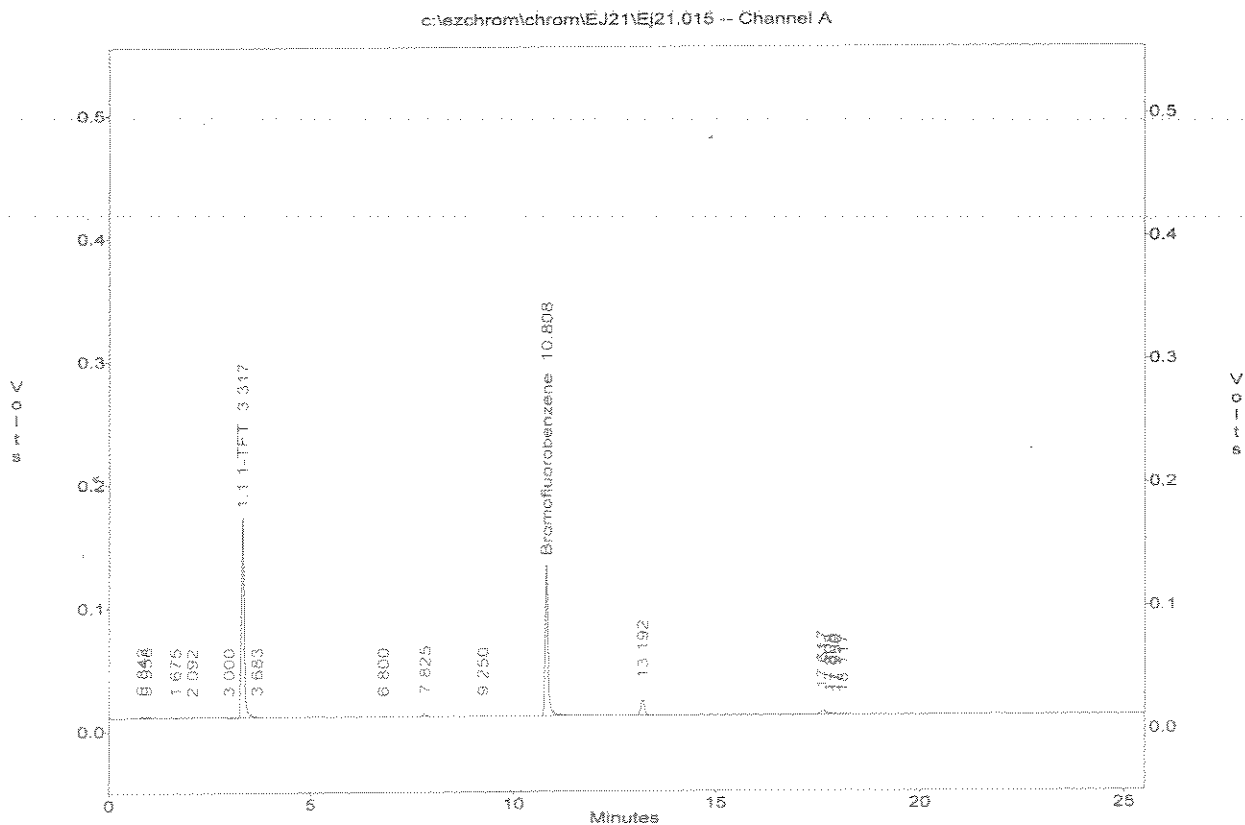
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.



File : c:\ezchrom\chrom\EJ21\Ej21.015
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-08 5.0ML W
Acquired : Oct 21, 2005 21:39:37
Printed : Oct 21, 2005 22:05:09
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
6	1,1,1-TFT	3.317	856046.0	23201.8	36.90
11	Bromofluorobenzene	10.808	631529.0	16280.2	38.79
G1	GASOLINE (TOTAL)		157995.0	17610.5	8.97
G2	GRO (C6-C10)		30067.0	14372.0	2.09
G3	GRO (2MP-124TMB)		32651.0	14472.4	2.26
G4	GRO (C5-C12)		157995.0	17253.5	9.16



4019

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TEYRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                      Date Extracted: 10/21/05 22:15
Sample ID:   86-S14-067                    Date Analyzed: 10/21/05 22:15
Lab Samp ID: J114-09T                      Dilution Factor: 10
Lab File ID: EJ21016A                     Matrix       : WATER
Ext Btch ID: VA39J13                       % Moisture    : NA
Calib. Ref.: EJ21013A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	3.9	1	.2
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	115	65-135	

RL : Reporting Limit

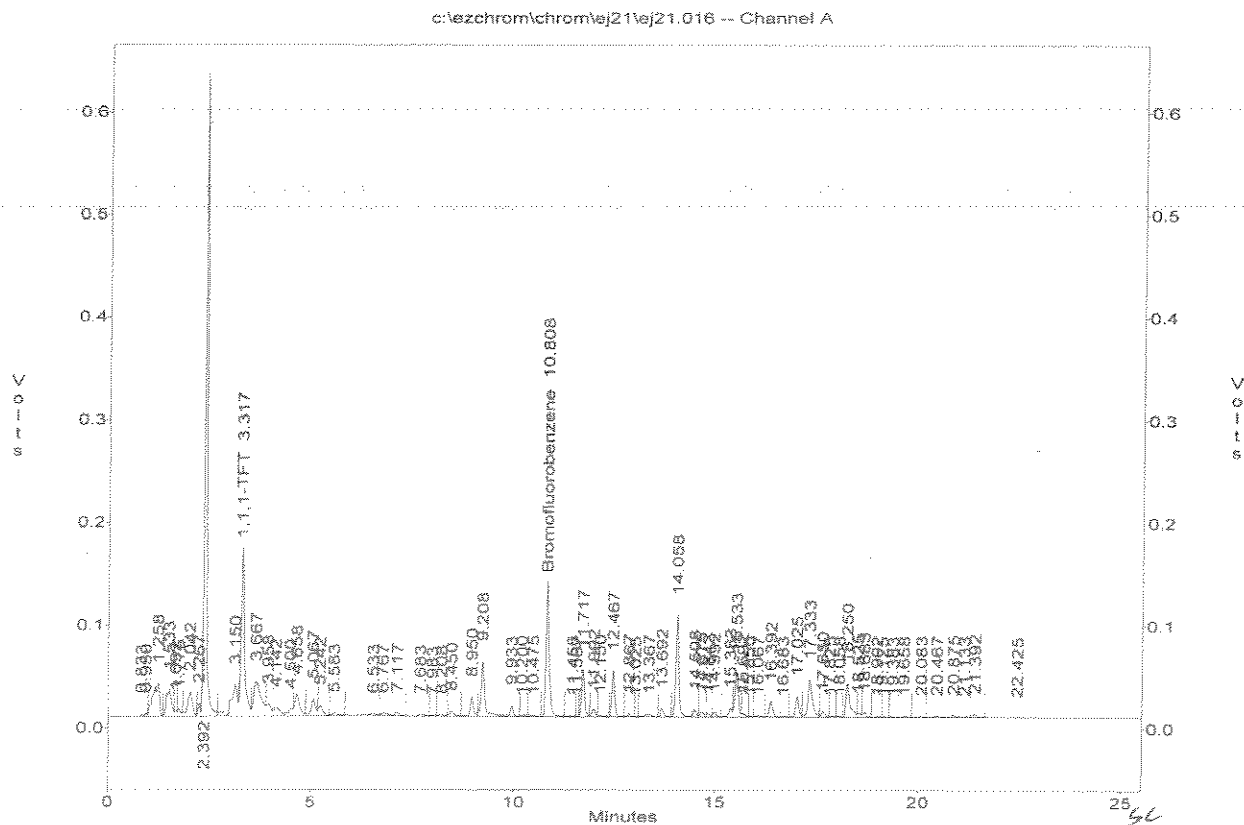
METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

EMAX
LABORATORIES, INC.

File : c:\ezchrom\chrom\ej21\ej21.016
Method : c:\ezchrom\methods\vg39j14.met
Sample ID : 05J114-09T .5ML W DF=10
Acquired : Oct 21, 2005 22:15:37
Printed : Oct 24, 2005 11:55:39
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
11	1,1,1-TFT	3.317	984137.0	23201.8	42.42
32	Bromofluorobenzene	10.808	751408.0	16280.2	46.15
G1	GASOLINE (TOTAL)		8396703.0	17610.5	476.80
G2	GRO (C6-C10)		5600743.0	14372.0	389.70
G3	GRO (2MP-124TMB)		5833738.0	14472.4	403.09
G4	GRO (C5-C12)		8253565.0	17253.5	478.37



4021

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                      Date Extracted: 10/21/05 22:51
Sample ID    : 86-S14-066                  Date Analyzed: 10/21/05 22:51
Lab Samp ID  : J114-10                     Dilution Factor: 1
Lab File ID  : EJ21017A                    Matrix          : WATER
Ext Btch ID  : VA39J13                     % Moisture       : NA
Calib. Ref.  : EJ21013A                    Instrument ID    : GC1039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.24	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	128	65-135	

RL : Reporting Limit

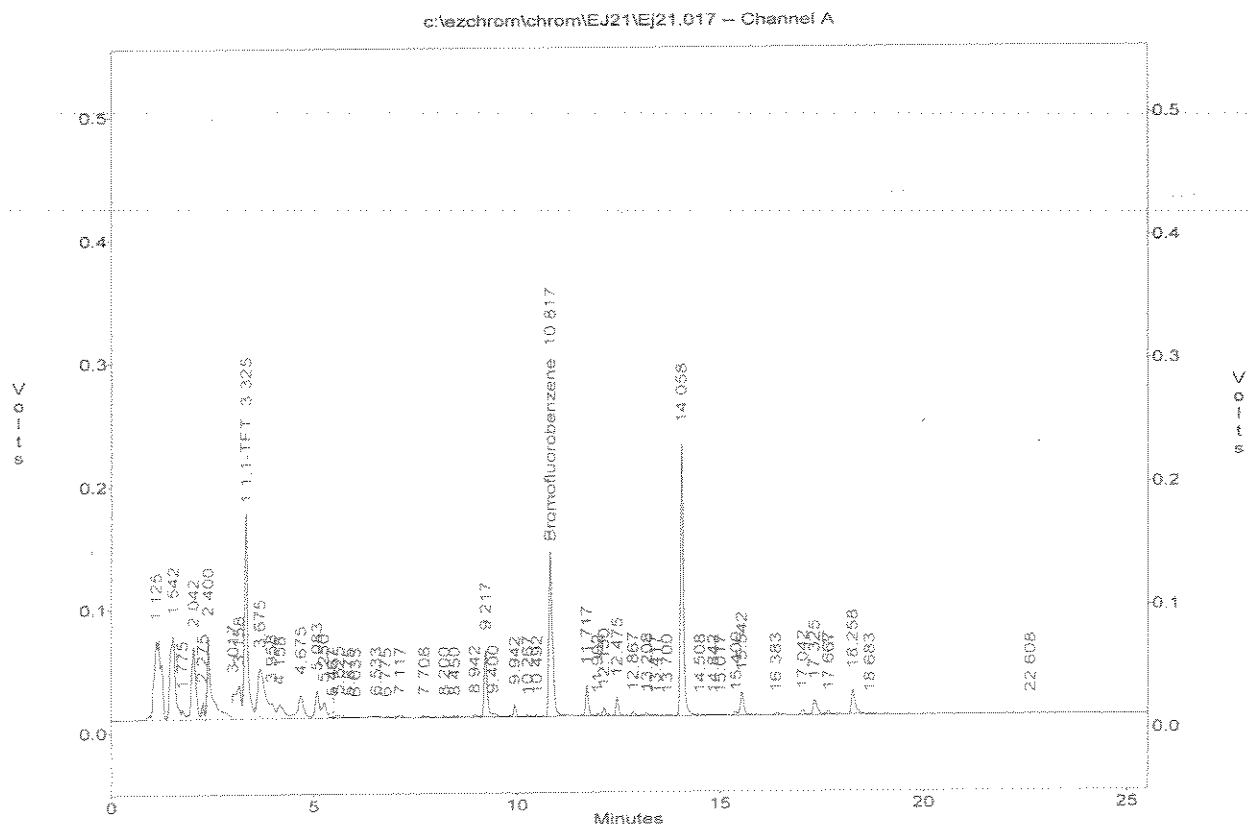


METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EJ21\Ej21.017
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-10 5.0ML W
Acquired : Oct 21, 2005 22:51:43
Printed : Oct 21, 2005 23:17:15
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
9	1,1,1-TFT	3.325	982602.0	23201.8	42.35
32	Bromofluorobenzene	10.817	831173.0	16280.2	51.05
G1	GASOLINE(TOTAL)		6602885.0	17610.5	374.94
G2	GRO(C6-C10)		3415536.0	14372.0	237.65
G3	GRO(2MP-124TMB)		4047840.0	14472.4	279.69
G4	GRO(C5-C12)		5794282.0	17253.5	335.83



4023

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/21/05 23:27
Sample ID:   86-S14-070                     Date Analyzed: 10/21/05 23:27
Lab Samp ID: J114-11                         Dilution Factor: 1
Lab File ID: EJ21018A                       Matrix          : WATER
Ext Btch ID: VA39J13                        % Moisture      : NA
Calib. Ref.: EJ21013A                      Instrument ID   : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	96	65-135	

RL : Reporting Limit

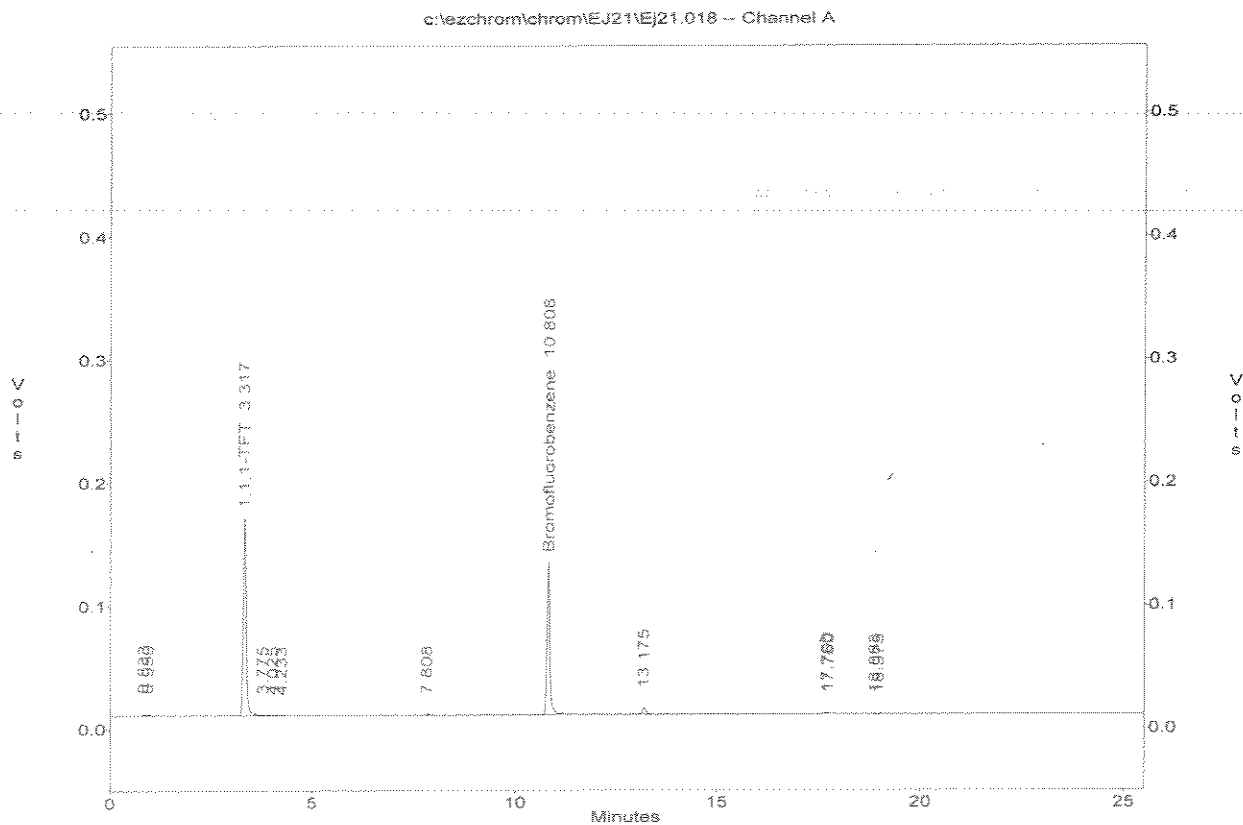


METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EJ21\Ej21.018
Method : c:\ezchrom\methods\Vg39j14.met
Sample ID : 05J114-11 5.0ML W
Acquired : Oct 21, 2005 23:27:51
Printed : Oct 21, 2005 23:53:23
User : SERGIO

Channel A Results

#	Peak Name	Ret. Time (Min)	Area	Ave. CF	ESTD Conc. (PPB)
3	1,1,1-TFT	3.317	859062.0	23201.8	37.03
8	Bromofluorobenzene	10.808	627118.0	16280.2	38.52
G1	GASOLINE(TOTAL)		71741.0	17610.5	4.07
G2	GRO(C6-C10)		25032.0	14372.0	1.74
G3	GRO(2MP-124TMB)		25032.0	14472.4	1.73
G4	GRO(C5-C12)		67215.0	17253.5	3.90



4025

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05J114

**METHOD 3010A/6010B
METALS BY ICP**

Nine (9) water samples were received on 10/19/05 for Metals analysis by Method 3010A/6010B in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW846, 3rd edition.

1. Holding Time

Analysis met holding time criteria.

2. Method Blank

Method blank was free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limit.

4. Serial Dilution / Post-Analytical Spike

Sample J114-02 was analyzed for serial dilution and post-analytical spike. All QC requirements were met.

5. Matrix Spike/Matrix Spike Duplicate

Sample J114-02 was spiked. All recoveries were within QC limit except Calcium in MS was out the limit.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception.

LAB CHRONICLE
METALS BY ICP

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO B6

SDG NO. : 05J114
Instrument ID : I-107

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep.		Notes
									Data FN	Batch	
MBLK1W	IPJ029WB	1	NA	10/21/0512:42			10/20/0514:30	107J033012	107J033010	IPJ029W	Method Blank
LCS1W	IPJ029WL	1	NA	10/21/0512:46			10/20/0514:30	107J033013	107J033010	IPJ029W	Lab Control Sample (LCS)
LCS1W	IPJ029WC	1	NA	10/21/0512:50			10/20/0514:30	107J033014	107J033010	IPJ029W	LCS Duplicate
86-S14-068AS	J114-02A	1	NA	10/21/0512:56			10/20/0514:30	107J033015	107J033010	IPJ029W	Analytical Spike Sample
86-S14-068MS	J114-02M	1	NA	10/21/0513:00			10/20/0514:30	107J033016	107J033010	IPJ029W	Matrix Spike Sample (MS)
86-S14-068	J114-02S	1	NA	10/21/0513:04			10/20/0514:30	107J033017	107J033010	IPJ029W	MS Duplicate (MSD)
86-S14-068DL	J114-02	1	NA	10/21/0513:09			10/20/0514:30	107J033018	107J033010	IPJ029W	Field Sample
86-S14-069	J114-02J	5	NA	10/21/0513:13			10/20/0514:30	107J033019	107J033010	IPJ029W	Diluted Sample
86-S14-072	J114-03	1	NA	10/21/0513:17			10/20/0514:30	107J033020	107J033010	IPJ029W	Field Sample
86-S14-071	J114-04	1	NA	10/21/0513:22			10/20/0514:30	107J033021	107J033010	IPJ029W	Field Sample
86-S14-065	J114-05	1	NA	10/21/0513:37			10/20/0514:30	107J033024	107J033022	IPJ029W	Field Sample
86-S14-073	J114-06	1	NA	10/21/0513:41			10/20/0514:30	107J033025	107J033022	IPJ029W	Field Sample
86-S14-067	J114-07	1	NA	10/21/0513:45			10/20/0514:30	107J033026	107J033022	IPJ029W	Field Sample
86-S14-066	J114-09	1	NA	10/21/0513:49			10/20/0514:30	107J033027	107J033022	IPJ029W	Field Sample
86-S14-070	J114-10	1	NA	10/21/0513:55			10/20/0514:30	107J033028	107J033022	IPJ029W	Field Sample
	J114-11	1	NA	10/21/0513:59			10/20/0514:30	107J033029	107J033022	IPJ029W	Field Sample

FN - Filename
% Moist - Percent Moisture

7002

26

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 10/17/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.      : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-068                 Date Analyzed: 10/21/05 13:09
Lab Samp ID: J114-02                  Dilution Factor: 1
Lab File ID: 107J033018               Matrix       : WATER
Ext Btch ID: IPJ029W                  % Moisture    : NA
Calib. Ref.: 107J033010               Instrument ID : EMAX107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	157	5	.1
Iron	1.07	.1	.04
Magnesium	47.4	5	.1
Potassium	ND	5	1
Sodium	35.3	5	.25

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/17/05
Project     : UST SITE 14, MPA, CTO 86     Date Received: 10/19/05
SDG NO.     : 05J114                      Date Extracted: 10/20/05 14:30
Sample ID   : 86-S14-069                  Date Analyzed: 10/21/05 13:17
Lab Samp ID : J114-03                     Dilution Factor: 1
Lab File ID : I07J033020                  Matrix       : WATER
Ext Btch ID : IPJ029W                     % Moisture    : NA
Calib. Ref. : I07J033010                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	153	5	.1
Iron	.977	.1	.04
Magnesium	43.8	5	.1
Potassium	3.54J	5	.1
Sodium	33.4	5	.25

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.     : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-072                Date Analyzed: 10/21/05 13:22
Lab Samp ID: J114-04                 Dilution Factor: 1
Lab File ID: 107J033021              Matrix      : WATER
Ext Btch ID: 1PJ029W                 % Moisture   : NA
Calib. Ref.: 107J033010              Instrument ID : EMAX1107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	236	5	.1
Iron	.657	.1	.04
Magnesium	87	5	.1
Potassium	2.08J	5	1
Sodium	30.9	5	.25

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.    : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-071               Date Analyzed: 10/21/05 13:37
Lab Samp ID: J114-05                Dilution Factor: 1
Lab File ID: 107J033024             Matrix       : WATER
Ext Btch ID: 1PJO29W                % Moisture   : NA
Calib. Ref.: 107J033022             Instrument ID : EMAXT107
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	218	5	.1
Iron	ND	.1	.04
Magnesium	88.7	5	.1
Potassium	2.65J	5	1
Sodium	35.9	5	.25

7006
CH

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.     : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID   : 86-S14-065             Date Analyzed: 10/21/05 13:41
Lab Samp ID : J114-06                Dilution Factor: 1
Lab File ID : 107J033025             Matrix       : WATER
Ext Btch ID : IPJ029W                % Moisture   : NA
Calib. Ref. : 107J033022             Instrument ID : EMAX107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	221	5	.1
Iron	1.3	.1	.04
Magnesium	67.1	5	.1
Potassium	1.99J	5	.1
Sodium	36.3	5	.25

7007

dy

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.     : 05J114                       Date Extracted: 10/20/05 14:30
Sample ID:   86-S14-073                    Date Analyzed: 10/21/05 13:45
Lab Samp ID: J114-07                       Dilution Factor: 1
Lab File ID: 107J033026                   Matrix       : WATER
Ext Btch ID: IPJ029W                      % Moisture   : NA
Calib. Ref.: 107J033022                   Instrument ID: EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	222	5	.1
Iron	2.57	.1	.04
Magnesium	89.7	5	.1
Potassium	1.89J	5	1
Sodium	34.2	5	.25

7008

41

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTD 86    Date Received: 10/19/05
SDG NO.     : 05J114                     Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-067                     Date Analyzed: 10/21/05 13:49
Lab Samp ID: J114-09                       Dilution Factor: 1
Lab File ID: 107J033027                   Matrix          : WATER
Ext Btch ID: 1PJ029W                       % Moisture      : NA
Calib. Ref.: 107J033022                   Instrument ID   : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	198	5	.1
Iron	3.93	.1	.04
Magnesium	56.2	5	.1
Potassium	1.48J	5	1
Sodium	47.5	5	.25

7009

81

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.     : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-066                Date Analyzed: 10/21/05 13:55
Lab Samp ID: J114-10                 Dilution Factor: 1
Lab File ID: 107J033028              Matrix       : WATER
Ext Btch ID: 1PJ029W                 % Moisture    : NA
Calib. Ref.: 107J033022              Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	202	5	.1
Iron	1.94	.1	.04
Magnesium	72.7	5	.1
Potassium	2.3J	5	1
Sodium	32.1	5	.25

7010

01

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.     : 05J114                       Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-070                      Date Analyzed: 10/21/05 13:59
Lab Samp ID: J114-11                       Dilution Factor: 1
Lab File ID: 107J033029                    Matrix       : WATER
Ext Btch ID: IPJ029W                       % Moisture   : NA
Calib. Ref.: 107J033022                    Instrument ID : EMAX1107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	261	5	.1
Iron	ND	.1	.04
Magnesium	105	5	.1
Potassium	3.38J	5	1
Sodium	28.4	5	.25

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: NA
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/20/05
SDG NO.     : 05J114                       Date Extracted: 10/20/05 14:30
Sample ID    : MBLK1W                      Date Analyzed: 10/21/05 12:42
Lab Samp ID  : IPJ029WB                    Dilution Factor: 1
Lab File ID  : 107J033012                  Matrix       : WATER
Ext Btch ID  : IPJ029W                     % Moisture   : NA
Calib. Ref.  : 107J033010                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	ND	5	.1
Iron	ND	.1	.04
Magnesium	ND	5	.1
Potassium	ND	5	1
Sodium	.535J	5	.25

7012

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG NO.: 05J114
METHOD: METHOD 3010A/6010B

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1 1 1
SAMPLE ID: MBLK1W
CONTROL NO.: IPJ029WB IPJ029WL IPJ029WC
LAB FILE ID: 107J033012 107J033013 107J033014
DATE TIME EXTRACTD: 10/20/0514:30 10/20/0514:30 10/20/0514:30 DATE COLLECTED: NA
DATE TIME ANALYZD: 10/21/0512:42 10/21/0512:46 10/21/0512:50 DATE RECEIVED: 10/20/05
PREP. BATCH: IPJ029W IPJ029W IPJ029W
CALIB. REF: 107J033010 107J033010 107J033010

ACCESSION:

PARAMETER	BLNK RSLT mg/L	SPIKE AMT mg/L	BS RSLT mg/L	BS % REC	SPIKE AMT mg/L	BSD RSLT mg/L	BSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	ND	50	48.8	98	50	49.2	98	1	80-120	20
Iron	ND	10	10.1	101	10	10.1	101	0	80-120	20
Magnesium	ND	50	49	98	50	49.4	99	1	80-120	20
Potassium	ND	50	50.2	100	50	51.2	102	2	80-120	20
Sodium	.535J	50	49.4	98	50	49.8	99	1	80-120	20

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG NO.: 05J114
METHOD: METHOD 3010A/6010B

MATRIX: WATER
DILTN FACTR: 1 1 1 % MOISTURE: NA
SAMPLE ID: 86-S14-068
CONTROL NO.: J114-02 J114-02M J114-02S
LAB FILE ID: 107J033018 107J033016 107J033017
DATE EXTCTD: 10/20/0514:30 10/20/0514:30 10/20/0514:30 DATE COLLECTED: 10/17/05
DATE ANALYZD: 10/21/0513:09 10/21/0513:00 10/21/0513:04 DATE RECEIVED: 10/19/05
PREP. BATCH: 1PJ029W 1PJ029W 1PJ029W
CALIB. REF: 107J033010 107J033010 107J033010

ACCESSION:

PARAMETER	SMPL RSLT mg/L	SPIKE AMT mg/L	MS RSLT mg/L	MS % REC	SPIKE AMT mg/L	MSD RSLT mg/L	MSD % REC	RPD %	QC LIMIT %	MAX RPD %
Calcium	157	50	196	77*	50	202	89	3	80-120	20
Iron	1.07	10	10.6	95	10	11	99	3	80-120	20
Magnesium	47.4	50	93.5	92	50	96	97	3	80-120	20
Potassium	ND	50	51.7	103	50	52.8	106	2	80-120	20
Sodium	35.3	50	82	93	50	85.3	100	4	80-120	20

7014

EMAX QUALITY CONTROL DATA
SERIAL DILUTION ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
BATCH NO.: 05J114
METHOD: METHOD 3010A/6010B

MATRIX: WATER
DILUTION FACTOR: 1 5 % MOISTURE: NA
SAMPLE ID: 86-S14-068 86-S14-068DL
EMAX SAMP ID: J114-02 J114-02J
LAB FILE ID: 107J033018 107J033019
DATE EXTRACTED: 10/20/0514:30 10/20/0514:30 DATE COLLECTED: 10/17/05
DATE ANALYZED: 10/21/0513:09 10/21/0513:13 DATE RECEIVED: 10/19/05
PREP. BATCH: IPJ029W IPJ029W
CALIB. REF: 107J033010 107J033010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SERIAL DIL RSLT (mg/L)	DIF RSLT %	QC LIMIT (%)
Calcium	157	159	1	10
Iron	1.07	1.09	2	10
Magnesium	47.4	46.9	1	10
Potassium	ND	ND	0	10
Sodium	35.3	37	5	10

7015_α

EMAX QUALITY CONTROL DATA
ANALYTICAL SPIKE ANALYSIS

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CYD 86
SDG NO.: 05J114
METHOD: METHOD 3010A/6010B

MATRIX: WATER % MOISTURE: NA
DILTN FACTR: 1
SAMPLE ID: 86-S14-068
CONTROL NO.: J114-02 J114-02A
LAB FILE ID: 107J033018 107J033015
DATE TIME EXTRACTED: 10/20/05 14:30 10/20/05 14:30 DATE COLLECTED: 10/17/05
DATE TIME ANALYZED: 10/21/05 13:09 10/21/05 12:56 DATE RECEIVED: 10/19/05
PREP. BATCH: 1PJ029W 1PJ029W
CALIB. REF: 107J033010 107J033010

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	AS RSLT (mg/L)	AS % REC	QC LIMIT (%)
Calcium	157	50	196	79	75-125
Iron	1.07	10	10.7	96	75-125
Magnesium	47.4	50	94.7	95	75-125
Potassium	ND	50	51.4	103	75-125
Sodium	35.3	50	82.9	95	75-125

REGULAR ICP QC CHECK TABLE

QC Limit%	ICV HIGH 95-105 mg/L	ICV 90-110 mg/L	CCV 90-110 mg/L	ICSAB 80-120 mg/L	ICSA 80-120 mg/L
Comp					
Al	10	5	5	500	500
Sb	2	1	1	1	0
As	2	1	1	1	0
Ba	2	1	1	0.5	0
Be	2	1	1	0.5	0
B	2	1	1	0.5	0
Cd	2	1	1	1	0
Ca	100	50	50	500	500
Cr	2	1	1	0.5	0
Co	2	1	1	0.5	0
Cu	2	1	1	0.5	0
Fe	10	5	5	200	200
Pb	2	1	1	1	0
Mg	100	50	50	500	500
Mn	2	1	1	0.5	0
Mo	2	1	1	1	0
Ni	2	1	1	1	0
K	100	50	50	50	0
Se	2	1	1	3.6	0
Ag	2	1	1	1	0
Na	100	50	50	10	0
Sr	2	1	1	0.5	0
Tl	2	1	1	3.6	0
Sn	10	5	5	1	0
Ti	2	1	1	1	0
V	2	1	1	0.5	0
Zn	2	1	1	1	0

ANALYSIS RUN LOG FOR ICP

SOP ☒ EMAX-6010-Rev. 3 ☐ EMAX-CLP-TAL ☐

Matrix: WATER Method File: 6010B_A2_10105 Autosampler Table: 1CP

Start Date: 10/21/05		End Date: 10/21/05		Time: 14:20		Book# A24 -039	
Data File Name	Prep. Batch	Lab Sample ID	DF	Notes	Matrix	Instrument No.	ID
01		30				S6	SM18, 09.47, 05
02		S3				S1	NA
03		S6				S2	NA
04		ICV				S3	SM18, 09.84, 03
05		ICB				S4	NA
06		MLTJ33				S5	NA
07		MLTJ22A				S6	SM18, 09.84, 04
08		IC9A1				ICV	09.87, 04
09		IC9A1				ICVH1	NA
10		ICV1				ICVH2	NA
11		CCB1				CCV	SM18, 09.83, 01
12	IPJ089W	IPJ089WB	1			ICSA	09.82, 02
13		W2				ICSA	09.82, 01
14		W2				ICSA	09.82, 01
15		1114-02A	1			ICSA	09.82, 01
16		02M				ICSA	09.82, 01
17		02S				ICSA	09.82, 01
18		02				ICSA	09.82, 01
19		02J	5			ICSA	09.82, 01
20		03				ICSA	09.82, 01
21		04				ICSA	09.82, 01
22		ICV2				ICSA	09.82, 01
23		CCB2				ICSA	09.82, 01
24		J114-05				ICSA	09.82, 01
25		016				ICSA	09.82, 01

SEQUENCE FILE : 1073033

4.18	19.33	34.43	44.53	54.63
LFID	LSID	TIME	DATE	DF
1073033001	S0	11:50	10/21/05	1
1073033002	S3	11:54	10/21/05	1
1073033003	S6	11:58	10/21/05	1
1073033004	ICV	12:02	10/21/05	1
1073033005	ICB	12:08	10/21/05	1
1073033006	MRL7J33	12:12	10/21/05	1
1073033007	MRL7J33A	12:16	10/21/05	1
1073033008	ICSA1	12:22	10/21/05	1
1073033009	ICSA1	12:26	10/21/05	1
1073033010	CCV1	12:32	10/21/05	1
1073033011	CCB1	12:38	10/21/05	1
1073033012	IPJ029WB	12:42	10/21/05	1
1073033013	IPJ029WL	12:46	10/21/05	1
1073033014	IPJ029WC	12:50	10/21/05	1
1073033015	J114-02A	12:56	10/21/05	1
1073033016	J114-02M	13:00	10/21/05	1
1073033017	J114-02S	13:04	10/21/05	1
1073033018	J114-02	13:09	10/21/05	1
1073033019	J114-02J	13:13	10/21/05	5
1073033020	J114-03	13:17	10/21/05	1
1073033021	J114-04	13:22	10/21/05	1
1073033022	CCV2	13:27	10/21/05	1
1073033023	CCB2	13:33	10/21/05	1
1073033024	J114-05	13:37	10/21/05	1
1073033025	J114-06	13:41	10/21/05	1
1073033026	J114-07	13:45	10/21/05	1
1073033027	J114-09	13:49	10/21/05	1
1073033028	J114-10	13:55	10/21/05	1
1073033029	J114-11	13:59	10/21/05	1
1073033030	J122-02	14:08	10/21/05	1
1073033031	CCV3	14:14	10/21/05	1
1073033032	CCB3	14:20	10/21/05	1

7019

50 5114

SDG : 03 107		UNIT : %																								ICP CHECK : 1073033										DATE : 10/21/05						INST : EMX1107			
ANALYTE	Al	Sb	As	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Ti	V	Zn																			
S9																																													
S3																																													
S6																																													
ICV	101	97	101	91	99	102	94	99	96	95	96	103	97	100	97	97	93	99	97	94	100	96	95	96	100	97	99																		
ICB																																													
HRL7J333																																													
HRL7J33A																																													
ICSA1	96																																												
ICSA81	95	89	99	93	92	89	91	88	84	96	89	92	97	88	86	84	104	92	93	108	90	95	83	92	99	92																			
CCV1	102	97	98	97	96	99	97	100	95	94	96	101	97	99	95	98	94	100	98	97	101	98	96	98	98	97																			
CCB1																																													
IPJ029WB																																													
IPJ029WL																																													
IPJ029WC																																													
J114-02A																																													
J114-02M																																													
J114-02S																																													
J114-02																																													
J114-02J																																													
J114-03																																													
J114-04																																													
CCV2	97	96	96	93	93	96	95	98	92	92	98	94	96	93	95	92	98	91	94	97	94	97	93	95	94	95																			
CCB2																																													
J114-05																																													
J114-06																																													
J114-07																																													
J114-09																																													
J114-10																																													
J114-11																																													
J122-02																																													
CCV3	99	97	93	96	94	98	96	99	93	92	94	99	97	98	93	96	94	101	95	95	98	96	93	96	96	95																			
CCB3																																													

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

7020

SUG : 023114

UNIT : UG/L

SUMMARY OF CALIBRATION BLANKS : 107J933 (WATER)

ANALYTE	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	Na	Sr	Tl	Sn	Pb	V	Zn
S0	7.54	2.68	19.0	260	040	360	320	1.33	890	1.35	1.37	1.06	3.80	8.22	100	5.26	2.35	75.7	3.82	2.18	000	020	20.9	4.80	110	1.87	1.63
S3																											
S6																											
ICV																											
ICB																											
MRL7333																											
MRL7333A																											
ICSA1																											
ICSA1	14.9	24.3	220	030	6.54	5.86			560	580	10.3		45.2														
CCV1																											
CCB1	9.18	8.36	3.02	170	090	1.83	050	460	1.34	580	680	420	5.05	11.3	000	6.31	2.07	58.5	630	680	14.7	080	16.7	930	100	1.59	1.92
IPJ029M8																											
IPJ029M1																											
IPJ029M2																											
J114-02A																											
J114-02M																											
J114-02S																											
J114-02J																											
J114-03																											
J114-04																											
CCV2																											
CCB2	2.88	12.8	9.12	610	100	5.15	180	1.86	890	1.45	1.71	420	5.58	12.3	300	5.26	3.73	483	51.1	3.55	220	050	9.90	9.58	610	1.14	1.92
J114-05																											
J114-06																											
J114-07																											
J114-09																											
J114-10																											
J114-11																											
J122-02																											
CCV3																											
CCB3	7.10	8.74	5.33	880	200	1.46	240	4.04	2.23	1.54	000	630	1.33	150	000	7.37	4.70	1118	35.1	2.18	000	050	3.64	2.91	1.49	0.920	1.06

QC limit of each parameter are listed in a table attached next to all the ICP check forms
* : Out of QC Limit

7021

Analysis Report

Summary

10/21/05 02:24:38 PM

page 1

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	S0	I07J033	6010B	10/21/05	11:50		X	IR
2	S3	I07J033	6010B	10/21/05	11:54		X	IR
3	S6	I07J033	6010B	10/21/05	11:58		X	IR
4	ICV	I07J033	6010B	10/21/05	12:02	AZ	S	CONC
5	ICB	I07J033	6010B	10/21/05	12:08	AZ	S	CONC
6	MRL7J33	I07J033	6010B	10/21/05	12:12	AZ	S	CONC
7	MRL7J33A	I07J033	6010B	10/21/05	12:16	AZ	S	CONC
8	ICSAI	I07J033	6010B	10/21/05	12:22	AZ	S	CONC
9	ICSABI	I07J033	6010B	10/21/05	12:26	AZ	S	CONC
10	CCV1	I07J033	6010B	10/21/05	12:32	AZ	S	CONC
11	CCB1	I07J033	6010B	10/21/05	12:38	AZ	S	CONC
12	IPJ029WB	I07J033	6010B	10/21/05	12:42	AZ	S	CONC
13	IPJ029WL	I07J033	6010B	10/21/05	12:46	AZ	S	CONC
14	IPJ029WC	I07J033	6010B	10/21/05	12:50	AZ	S	CONC
15	J114-02A	I07J033	6010B	10/21/05	12:56	AZ	S	CONC
16	J114-02M	I07J033	6010B	10/21/05	13:00	AZ	S	CONC
17	J114-02S	I07J033	6010B	10/21/05	13:04	AZ	S	CONC
18	J114-02	I07J033	6010B	10/21/05	13:09	AZ	S	CONC
19	J114-02J	I07J033	6010B	10/21/05	13:13	AZ	S	CONC
20	J114-03	I07J033	6010B	10/21/05	13:17	AZ	S	CONC
21	J114-04	I07J033	6010B	10/21/05	13:22	AZ	S	CONC
22	CCV2	I07J033	6010B	10/21/05	13:27	AZ	S	CONC
23	CCB2	I07J033	6010B	10/21/05	13:33	AZ	S	CONC
24	J114-05	I07J033	6010B	10/21/05	13:37	AZ	S	CONC
25	J114-06	I07J033	6010B	10/21/05	13:41	AZ	S	CONC
26	J114-07	I07J033	6010B	10/21/05	13:45	AZ	S	CONC
27	J114-09	I07J033	6010B	10/21/05	13:49	AZ	S	CONC
28	J114-10	I07J033	6010B	10/21/05	13:55	AZ	S	CONC
29	J122-02 J114-11	I07J033	6010B	10/21/05	13:59	AZ	S	CONC
30	J122-02	I07J033	6010B	10/21/05	14:08	AZ	S	CONC
31	CCV2	I07J033	6010B	10/21/05	14:14	AZ	S	CONC
32	CCB2	I07J033	6010B	10/21/05	14:20	AZ	S	CONC

7022

Analysis Report

Averages

10/21/05 02:24:38 PM

page 2

#	Sample Name	Al	Sb	As	Ba	Be	B
1	S0	.21999	-.0025	.0095	-.00249	.023	.0005
2	S3.	10.969					
3	S6		2.83349	1.32649	11.3545	19.845	2.709
4	ICV	5.033	.9711	1.005	.9143	.9920	1.022
5	ICB	.0075	.0027	-.0190	.0003	-.0000	.0004
6	MRL7J33	.0021	.2784	.4637	.0200	.0032	.0023
7	MRL7J33A	.0222	.2742	.5017	.0200	.0032	.0037
8	ICSAI	478.5	.0149	.0243	.0002	.0000	.0065
9	ICSABI	476.9	.8913	.9875	.4634	.4636	.4615
10	CCV1	5.090	.9711	.9755	.9710	.9639	.9880
11	CCB1	-.0092	.0084	-.0030	.0002	-.0001	.0018
12	IPJ029WB	-.0007	-.0061	.0129	.0003	-.0002	-.0004
13	IPJ029WL	9.945	4.564	.9848	.9153	.9838	1.018
14	IPJ029WC	9.982	4.571	.9763	.9211	.9873	1.026
15	J114-02A	9.804	4.374	.9832	.9472	.9414	1.222
16	J114-02M	9.732	4.439	1.007	.9377	.9337	1.202
17	J114-02S	10.11	4.580	1.020	.9795	.9695	1.244
18	J114-02	-.0162	.0041	-.0160	.0553	-.0000	.2245
19	J114-02J	.0010	.0063	-.0029	.0114	-.0001	.0458
20	J114-03	.0071	.0012	.0082	.0527	.0000	.2138
21	J114-04	.0075	.0020	-.0064	.0386	.0000	.2886
22	CCV2	4.869	.9616	.9553	.9329	.9309	.9551
23	CCB2	.0029	.0128	-.0091	.0006	-.0001	.0052
24	J114-05	.0069	.0082	.0061	.0885	-.0001	.3620
25	J114-06	.0028	.0028	.0100	.2127	-.0001	.3079
26	J114-07	-.0046	-.0003	.0047	.0293	-.0001	.3542
27	J114-09	-.0037	.0223	.0033	.4598	-.0001	.2843
28	J114-10	-.0106	.0086	-.0223	.6118	-.0001	.2652
29	J122-02 J114-11	.0047	.0188	.0068	.0144	-.0001	.3550
30	J122-02	.7502	.0143	1.041	.7369	-.0001	.2453
31	CCV2	4.971	.9674	.9323	.9585	.9447	.9791
32	CCB2	.0071	.0087	-.0053	.0009	-.0002	.0015

#	Sample Name	Cd	Ca	Cr	Co	Cu	Fe
1	S0	.00449	.02749	.003	-.01499	.0025	0
2	S3		208.553				23.473
3	S6	5.98999		4.465	10.3475	2.91849	
4	ICV	.9435	49.67	.9596	.9519	.9563	5.160
5	ICB	.0003	-.0013	-.0009	.0014	-.0014	-.0011
6	MRL7J33	.0379	5.049	.0686	.0655	.0576	.0528
7	MRL7J33A	.0374	5.092	.0710	.0710	.0583	.0533
8	ICSAI	-.0059	457.3	.0006	-.0006	.0103	178.8
9	ICSABI	.8947	454.8	.4402	.4189	.4783	177.4
10	CCV1	.9662	49.88	.9519	.9436	.9597	5.046
11	CCB1	.0001	-.0005	-.0013	.0006	-.0007	.0004
12	IPJ029WB	-.0006	.0093	-.0009	-.0023	-.0017	.0004
13	IPJ029WL	.9373	48.83	.9535	.9412	.9596	10.09
14	IPJ029WC	.9386	49.15	.9526	.9379	.9630	10.12
15	J114-02A	.9103	196.3	.9089	.8933	.9364	10.68
16	J114-02M	.9051	195.6	.8952	.8851	.9278	10.59
17	J114-02S	.9303	201.6	.9301	.9143	.9659	10.97

7023

Analysis Report

Averages

10/21/05 02:24:38 PM

page 3

#	Sample Name	Cd	Ca	Cr	Co	Cu	Fe
18	J114-02	.0006	157.0	-.0011	.0004	-.0022	1.073
19	J114-02J	.0007	31.72	-.0014	-.0032	-.0003	.2179
20	J114-03	.0010	152.8	.0009	.0041	.0029	.9765
21	J114-04	.0001	236.0	.0015	.0032	.0005	.6569
22	CCV2	.9493	48.92	.9224	.9187	.9206	4.897
23	CCB2	-.0002	-.0019	-.0009	-.0014	-.0017	-.0004
24	J114-05	.0004	217.8	-.0013	-.0028	.0002	.0261
25	J114-06	-.0007	221.2	-.0007	.0014	-.0008	1.304
26	J114-07	-.0008	221.9	-.0009	-.0006	-.0001	2.569
27	J114-09	-.0001	198.0	-.0002	-.0010	.0012	3.926
28	J114-10	.0003	201.5	-.0007	.0015	-.0006	1.937
29	J122-02 J114-11	-.0008	260.7	.0002	.0023	.0007	.0141
30	J122-02	.1627	135.1	.0065	.0033	.0072	26.85
31	CCV2	.9593	49.27	.9315	.9218	.9388	4.963
32	CCB2	-.0002	-.0040	.0022	.0015	.0000	.0006

#	Sample Name	Pb	Mg	Mn	Mo	Ni	K
1	S0	.03599	.006	.0025	.00449	-.015	.48299
2	S3		49.3645				14.348
3	S6	5.371		9.83699	.95449	7.2045	
4	ICV	.9704	50.12	.9739	.9663	.9330	49.71
5	ICB	-.0030	-.0082	-.0001	-.0053	.0024	.0757
6	MRL7J33	.0491	5.060	.0000	.0453	.0489	5.704
7	MRL7J33A	.0426	5.047	.0003	.0400	.0494	5.485
8	ICSAI	.0453	490.0	.0007	.0047	-.0001	-.0949
9	ICSABI	.9191	484.7	.4421	.8626	.8408	51.79
10	CCV1	.9652	49.39	.9528	.9779	.9352	49.92
11	CCB1	-.0051	-.0113	.0000	-.0063	.0021	-.0505
12	IPJ029WB	-.0124	-.0337	-.0002	-.0105	-.0008	-.5192
13	IPJ029WL	.9773	49.03	.9668	.9621	.9366	50.22
14	IPJ029WC	.9786	49.43	.9706	.9652	.9393	51.22
15	J114-02A	.9422	94.65	1.586	.9231	.8902	51.41
16	J114-02M	.9243	93.49	1.575	.9105	.8798	51.69
17	J114-02S	.9398	96.04	1.628	.9463	.9213	52.76
18	J114-02	-.0038	47.37	.6949	-.0063	-.0001	.3461
19	J114-02J	.0078	9.383	.1407	-.0042	.0033	-.1010
20	J114-03	.0065	43.84	.6826	-.0063	.0035	3.537
21	J114-04	.0041	87.02	.6641	-.0011	.0050	2.081
22	CCV2	.9439	48.14	.9254	.9463	.9236	49.20
23	CCB2	.0056	-.0123	-.0003	-.0053	.0037	.4832
24	J114-05	.0097	88.73	1.678	-.0032	.0587	2.647
25	J114-06	.0097	67.09	.9769	-.0032	.0030	1.990
26	J114-07	-.0023	89.71	.9936	-.0053	.0733	1.893
27	J114-09	-.0101	56.18	.9515	.0010	-.0024	1.478
28	J114-10	.0011	72.74	1.179	-.0032	.0082	2.304
29	J122-02 J114-11	.0084	104.7	.5513	-.0032	.0055	3.375
30	J122-02	-.0086	41.07	1.031	-.0054	.0068	24.63
31	CCV2	.9687	48.80	.9340	.9558	.9405	50.54
32	CCB2	-.0013	-.0001	.0000	-.0074	.0047	1.118

7024

Analysis Report

Averages

10/21/05 02:24:38 PM

page 4

#	Sample Name	Se	Ag	Na	Sr	Tl	Sn
1	S0	-.019	-.002	-.016	.246	-.021	.004
2	S3			3.394			
3	S6	1.529	7.31099		36.7265	1.8875	5.19799
4	ICV	.9704	.9402	49.76	.9614	.9527	4.785
5	ICB	.0038	-.0022	.0000	.0000	.0209	-.0048
6	MRL7J33	.7457	.0676	5.557	-.0002	.4139	-.0145
7	MRL7J33A	.7751	.0641	5.528	.0004	.4306	.0028
8	ICSAI	-.0856	-.0127	.4839	-.0019	.2922	-.0104
9	ICSABI	3.305	.9257	10.78	.4499	3.405	.8325
10	CCV1	.9782	.9662	50.28	.9786	.9848	4.814
11	CCB1	.0006	-.0007	.0147	-.0001	.0167	-.0009
12	IPJ029WB	.0064	-.0037	.5352	-.0002	.0052	-.0068
13	IPJ029WL	.9424	.9334	49.40	.9610	.9812	.9382
14	IPJ029WC	.9878	.9329	49.85	.9695	.9723	.9344
15	J114-02A	.9297	.8540	82.90	1.556	.9710	.8925
16	J114-02M	.9483	.9029	81.99	1.542	.8931	.9014
17	J114-02S	.9456	.9346	85.26	1.605	.9850	.9027
18	J114-02	-.0256	-.0021	35.26	.6495	.0063	-.0173
19	J114-02J	.0254	-.0001	7.405	.1291	.0094	-.0077
20	J114-03	-.0223	-.0001	33.38	.6122	.0134	.0173
21	J114-04	.0137	-.0001	30.95	.8287	.0277	.0087
22	CCV2	.9089	.9426	48.40	.9399	.9718	4.663
23	CCB2	-.0511	-.0036	.2199	.0001	.0099	-.0096
24	J114-05	-.0333	-.0007	35.85	.6977	.0362	-.0135
25	J114-06	.0184	-.0005	36.33	.9706	.0260	.0010
26	J114-07	-.0162	-.0012	34.19	.7254	.0174	.0058
27	J114-09	.0303	-.0020	47.51	1.068	.0108	-.0009
28	J114-10	-.0114	-.0016	32.06	.9279	-.0124	.0096
29	J122-02 J114-11	.0261	.0002	28.45	.8003	.0047	-.0134
30	J122-02	.0824	-.0010	2209.	1.304	.0130	.0373
31	CCV2	.9492	.9517	49.00	.9613	.9616	4.664
32	CCB3	.0351	-.0022	.0000	.0001	-.0036	.0029

A 3/12/05

#	Sample Name	Ti	V	Zn
1	S0	.00799	.002	.07099
2	S3			
3	S6	7.8605	2.5065	17.5085
4	ICV	.9962	.9703	.9874
5	ICB	.0001	-.0019	.0016
6	MRL7J33	.0000	.0765	.0217
7	MRL7J33A	.0006	.0768	.0219
8	ICSAI	.0042	.0102	-.0026
9	ICSABI	.9218	.4941	.9213
10	CCV1	.9805	.9778	.9727
11	CCB1	.0001	-.0016	.0019
12	IPJ029WB	-.0000	-.0034	.0051
13	IPJ029WL	.9921	.9704	.9699
14	IPJ029WC	.9985	.9729	.9723
15	J114-02A	.9651	.9346	1.068
16	J114-02M	.9568	.9274	1.058
17	J114-02S	.9887	.9655	1.090

7025

Analysis Report

Averages

10/21/05 02:24:38 PM

page 5

#	Sample Name	Ti	V	Zn
18	J114-02	.0001	-.0030	.1433
19	J114-02J	.0009	-.0007	.0313
20	J114-03	.0021	.0014	.4145
21	J114-04	.0034	-.0011	.0685
22	CCV2	.9460	.9444	.9475
23	CCB2	.0006	-.0011	.0019
24	J114-05	.0026	.0163	.0197
25	J114-06	.0027	-.0009	.0053
26	J114-07	.0025	.0039	.0328
27	J114-09	.0028	-.0003	.0289
28	J114-1D	.0025	-.0004	.0651
29	J122-02 J114-11	.0042	-.0002	.0585
30	J122-02	.0746	.0159	.0854
31	CCV2	.9641	.9569	.9536
32	CCB2	.0015	-.0009	.0011

#2 10/21/05

7026

Standardization Rpt.

10/21/05 11:54:45 AM

page 1

Method: 6010B Standard: S0

Run Time: 10/21/05 11:50:44

Elem	Al	Sb	As	Ba	Be	B	Cd
Avge	.2200	-.0025	.0095	-.0025	.0230	.0005	.0045
SDev	.0269	.0318	.0035	.0035	.0000	.0021	.0021
%RSD	12.21	1273.	37.22	141.4	.0000	424.3	47.14
#1	.2390	.0200	.0120	.0000	.0230	.0020	.0060
#2	.2010	-.0250	.0070	-.0050	.0230	-.0010	.0030
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Avge	.0275	.0030	-.0150	.0025	.0000	.0360	.0060
SDev	.0021	.0028	.0071	.0021	.0042	.0085	.0085
%RSD	7.714	94.28	47.14	84.85	.0000	23.57	141.4
#1	.0260	.0010	-.0100	.0010	.0030	.0300	.0120
#2	.0290	.0050	-.0200	.0040	-.0030	.0420	.0000
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Avge	.0025	.0045	-.0150	.4830	-.0190	-.0020	-.0160
SDev	.0021	.0007	.0099	.1952	.0071	.0028	.0000
%RSD	84.85	15.71	66.00	40.41	37.22	141.4	.0000
#1	.0040	.0050	-.0080	.6210	-.0140	-.0040	-.0160
#2	.0010	.0040	-.0220	.3450	-.0240	.0000	-.0160
Elem	Sr	Tl	Sn	Ti	V	Zn	
Avge	.2460	-.0210	.0040	.0080	.0020	.0710	
SDev	.0000	.0156	.0057	.0028	.0000	.0071	
%RSD	.0000	74.08	141.4	35.36	.0000	9.959	
#1	.2460	-.0100	.0080	.0100	.0020	.0660	
#2	.2460	-.0320	.0000	.0060	.0020	.0760	

7027

Standardization Rpt.

10/21/05 11:58:49 AM

page 1

Method: 6010B Standard: S3

Run Time: 10/21/05 11:54:49

Elem	Al	Ca	Fe	Mg	K	Na
Avge	10.97	208.6	23.47	49.36	14.35	3.394
SDev.	.09	1.2	.21	1.08	.07	.040
%RSD	.8251	.5944	.8977	2.196	.4830	1.167
#1	11.03	209.4	23.62	50.13	14.40	3.422
#2	10.90	207.7	23.32	48.60	14.30	3.366

7028

Standardization Rpt.

10/21/05 12:02:32 PM

page 1

Method: 6010B Standard: S6

Run Time: 10/21/05 11:58:53

Elem	Sb	As	Ba	Be	B	Cd	Cr
Avge	2.833	1.326	11.35	19.84	2.709	5.990	4.465
SDev	.012	.018	.08	.12	.023	.042	.021
%RSD	.4242	1.333	.6913	.6200	.8353	.7083	.4751
#1	2.825	1.314	11.30	19.76	2.693	5.960	4.450
#2	2.842	1.339	11.41	19.93	2.725	6.020	4.480
Elem	Co	Cu	Pb	Mn	Mo	Ni	Se
Avge	10.35	2.918	5.371	9.837	.9545	7.205	1.529
SDev	.05	.019	.017	.061	.0149	.018	.013
%RSD	.4852	.6542	.3160	.6182	1.556	.2454	.8324
#1	10.31	2.905	5.383	9.794	.9440	7.192	1.538
#2	10.38	2.932	5.359	9.880	.9650	7.217	1.520
Elem	Ag	Sr	Tl	Sn	Ti	V	Zn
Avge	7.311	36.73	1.888	5.198	7.861	2.507	17.51
SDev	.033	.23	.029	.006	.049	.011	.08
%RSD	.4449	.6257	1.536	.1088	.6207	.4232	.4564
#1	7.288	36.56	1.908	5.194	7.826	2.499	17.45
#2	7.334	36.89	1.867	5.202	7.895	2.514	17.57

7029

Standardization

Report

10/21/05 12:02:32 PM

page 1

Method: 6010B

Slope = Conc(SIR)/IR

Element	Wavelen	High std	Low std	Slope	Y-intercept	Date Standardized
Al	308.215	S3	S0	.930319	-.204670	10/21/05 11:58:53
Sb	206.838	S6	S0	.620118	.001550	10/21/05 11:58:53
As	193.696	S6	S0	1.52069	-.014447	10/21/05 11:58:53
Ba	493.409	S6	S0	.176103	.000440	10/21/05 11:58:53
Be	313.042	S6	S0	.101003	-.002323	10/21/05 11:58:53
B	249.678	S6	S0	.737951	-.000369	10/21/05 11:58:53
Cd	228.802	S6	S0	.339936	-.001530	10/21/05 11:58:53
Ca	317.933	S3	S0	.479564	-.013188	10/21/05 11:58:53
Cr	267.716	S6	S0	.448398	-.001345	10/21/05 11:58:53
Co	228.616	S6	S0	.193797	.002907	10/21/05 11:58:53
Cu	324.754	S6	S0	.686164	-.001715	10/21/05 11:58:53
Fe	259.940	S3	S0	.426064	.000000	10/21/05 11:58:53
Pb	220.353	S6	S0	.373589	-.013449	10/21/05 11:58:53
Mg	279.078	S3	S0	2.02601	-.012156	10/21/05 11:58:53
Mn	257.610	S6	S0	.203340	-.000508	10/21/05 11:58:53
Mo	202.030	S6	S0	2.10572	-.009476	10/21/05 11:58:53
Ni	231.604	S6	S0	.277027	.004155	10/21/05 11:58:53
K	766.491	S3	S0	7.21168	-3.48324	10/21/05 11:58:53
Se	196.026	S6	S0	1.27788	.024280	10/21/05 11:58:53
Ag	328.068	S6	S0	.273449	.000547	10/21/05 11:58:53
Na	588.995	S3	S0	29.3255	.469208	10/21/05 11:58:53
Sr	421.552	S6	S0	.054824	-.013487	10/21/05 11:58:53
Tl	190.864	S6	S0	1.04255	.021894	10/21/05 11:58:53
Sn	189.989	S6	S0	1.92546	-.007702	10/21/05 11:58:53
Ti	334.941	S6	S0	.253886	-.002031	10/21/05 11:58:53
V	292.402	S6	S0	.734658	-.001469	10/21/05 11:58:53
Zn	213.856	S6	S0	.114401	-.008122	10/21/05 11:58:53

7030

Standardization

Readback Report

10/21/05 12:02:32 PM

page 1

Method: 6010B

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Al	308.215	S0	.000000	.000000	-.000000
		S3	10.0000	10.0000	.000000
Sb	206.838	S0	.000000	.000000	-.000000
		S6	2.00000	1.75865	.241346
As	193.696	S0	.000000	-.000000	.000000
		S6	2.00000	2.00275	-.002746
Ba	493.409	S0	.000000	-.000000	.000000
		S6	2.00000	2.00000	.000000
Be	313.042	S0	.000000	.000000	-.000000
		S6	2.00000	2.00209	-.002086
B	249.678	S0	.000000	-.000000	.000000
		S6	2.00000	1.99874	.001260
Cd	228.802	S0	.000000	-.000000	.000000
		S6	2.00000	2.03469	-.034688
Ca	317.933	S0	.000000	.000000	-.000000
		S3	100.000	100.002	-.001610
Cr	267.716	S0	.000000	.000000	-.000000
		S6	2.00000	2.00075	-.000752
Co	228.616	S0	.000000	.000000	-.000000
		S6	2.00000	2.00822	-.008222
Cu	324.754	S0	.000000	.000000	-.000000
		S6	2.00000	2.00086	-.000855

7031

Standardization

Readback Report

10/21/05 12:02:32 PM

page 2

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Fe	259.940	S0	.000000	.000000	.000000
		S3	10.0000	10.0010	-.001000

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Pb	220.353	S0	.000000	.000000	-.000000
		S6	2.00000	1.99310	.006904

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Mg	279.078	S0	.000000	.000000	-.000000
		S3	100.000	100.001	-.000771

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Mn	257.610	S0	.000000	-.000000	.000000
		S6	2.00000	1.99975	.000250

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Mo	202.030	S0	.000000	.000000	-.000000
		S6	2.00000	2.00044	-.000436

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ni	231.604	S0	.000000	-.000000	.000000
		S6	2.00000	2.00000	.000000

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
K	766.491	S0	.000000	.000000	-.000000
		S3	100.000	99.9900	.010002

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Se	196.026	S0	.000000	.000000	-.000000
		S6	2.00000	1.97817	.021834

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ag	328.068	S0	.000000	.000000	-.000000
		S6	2.00000	1.99973	.000268

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Na	588.995	S0	.000000	-.000000	.000000
		S3	100.000	100.000	.000000

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Sr	421.552	S0	.000000	-.000000	.000000
		S6	2.00000	2.00000	.000000

7032

Standardization

Readback Report

10/21/05 12:02:32 PM

page 3

Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Tl	190.864	S0	.000000	.000000	-.000000
		S6	2.00000	1.98971	.010290
Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Sn	189.989	S0	.000000	-.000000	.000000
		S6	10.0000	10.0008	-.000835
Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Ti	334.941	S0	.000000	.000000	-.000000
		S6	2.00000	1.99364	.006360
Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
V	292.402	S0	.000000	.000000	-.000000
		S6	2.00000	1.83995	.160048
Element	Wavelength	Standard	Known Concentration	Measured Concentration	Residual Concentration
Zn	213.856	S0	.000000	-.000000	.000000
		S6	2.00000	1.99487	.005126

7033

Analysis Report

10/21/05 12:06:34 PM

page 1

 Method: 6010B Sample Name: ICV
 Run Time: 10/21/05 12:02:35
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Operator: AZ

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	5.033	.9711	1.005	.9143	.9920	1.022	.9435
SDev	.072	.0146	.001	.0173	.0156	.017	.0103
%RSD	1.431	1.506	.1173	1.893	1.575	1.637	1.097
#1	5.084	.9815	1.004	.9265	1.003	1.033	.9508
#2	4.982	.9608	1.006	.9020	.9810	1.010	.9361
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	49.67	.9596	.9519	.9563	5.160	.9704	50.12
SDev	.51	.0086	.0104	.0165	.071	.0143	1.13
%RSD	1.023	.8920	1.088	1.726	1.374	1.474	2.256
#1	50.03	.9656	.9592	.9680	5.210	.9806	50.92
#2	49.31	.9535	.9445	.9447	5.109	.9603	49.32
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.9739	.9663	.9330	49.71	.9704	.9402	49.76
SDev	.0127	.0164	.0106	.43	.0442	.0077	.80
%RSD	1.301	1.695	1.134	.8619	4.556	.8240	1.604
#1	.9829	.9779	.9405	50.01	.9392	.9457	50.32
#2	.9650	.9547	.9255	49.41	1.002	.9347	49.19
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	.9614	.9527	4.785	.9962	.9703	.9874	
SDev	.0179	.0349	.042	.0152	.0138	.0078	
%RSD	1.857	3.662	.8819	1.524	1.418	.7872	
#1	.9741	.9280	4.815	1.007	.9801	.9929	
#2	.9488	.9774	4.755	.9854	.9606	.9819	

7034

Analysis Report

10/21/05 12:12:26 PM

page 1

 Method: 6010B Sample Name: ICB
 Run Time: 10/21/05 12:08:18
 Comment: INST.I07
 Mode: CONC Corr. Factor: 1

Operator: AZ

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0075	.0027	-.0190	.0003	-.0000	.0004	.0003
SDev	.0014	.0267	.0022	.0003	.0001	.0042	.0012
%RSD	17.88	994.4	11.34	94.27	140.9	1148.	377.8

#1	.0085	.0215	-.0205	.0004	-.0000	.0033	.0012
#2	.0066	-.0162	-.0175	.0001	-.0001	-.0026	-.0005

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0013	-.0009	.0014	-.0014	-.0011	-.0030	-.0082
SDev	.0044	.0044	.0044	.0034	.0015	.0069	.0458
%RSD	331.8	493.4	323.2	247.9	141.5	228.2	556.9

#1	.0018	.0022	.0045	.0010	.0000	.0018	.0242
#2	-.0045	-.0040	-.0017	-.0038	-.0021	-.0079	-.0406

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0001	-.0053	.0024	.0757	.0038	-.0022	-.0000
SDev	.0006	.0030	.0014	1.821	.0723	.0039	.0000
%RSD	566.1	56.57	58.23	2404.	1891.	176.8	.0000

#1	.0003	-.0074	.0033	1.363	.0550	.0005	-.0000
#2	-.0005	-.0032	.0014	-1.212	-.0473	-.0049	-.0000

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0000	.0209	-.0048	.0001	-.0019	.0016
SDev	.0000	.0295	.0151	.0009	.0029	.0012
%RSD	140.4	141.4	313.4	807.3	154.9	74.73

#1	.0001	.0000	.0058	.0007	.0002	.0025
#2	.0000	.0417	-.0155	-.0005	-.0039	.0008

7035

Analysis Report

10/21/05 12:16:37 PM

page 1

Method: 6010B Sample Name: MRL7J33

Operator: AZ

Run Time: 10/21/05 12:12:29

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	✓ Sb	✓ As	✓ Ba	✓ Be	B	✓ Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0021	.2784	.4637	.0200	.0032	.0023	.0379
SDev	.0085	.0152	.0462	.0003	.0000	.0016	.0001
%RSD	410.2	5.458	9.974	1.247	.0610	69.12	.1969
#1	.0081	.2677	.4310	.0198	.0032	.0034	.0380
#2	-.0039	.2892	.4964	.0201	.0032	.0012	.0379
Elem	Ca	✓ Cr	✓ Co	✓ Cu	Fe	✓ Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	5.049	.0686	.0655	.0576	.0528	.0491	5.060
SDev	.007	.0019	.0010	.0014	.0006	.0032	.020
%RSD	.1360	2.780	1.468	2.523	1.147	6.460	.3977
#1	5.044	.0699	.0648	.0587	.0524	.0514	5.074
#2	5.053	.0672	.0662	.0566	.0533	.0469	5.046
Elem	Mn	✓ Mo	✓ Ni	K	✓ Se	✓ Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0000	.0453	.0489	5.704	.7457	.0676	5.557
SDev	.0004	.0030	.0014	2.111	.0425	.0012	.021
%RSD	2328.	6.577	2.804	37.01	5.698	1.717	.3731
#1	-.0003	.0474	.0499	7.197	.7156	.0684	5.543
#2	.0003	.0432	.0479	4.212	.7757	.0667	5.572
Elem	Sr	✓ Tl	Sn	Ti	✓ V	✓ Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	-.0002	.4139	-.0145	.0000	.0765	.0217	
SDev	.0000	.0037	.0109	.0006	.0018	.0007	
%RSD	.1825	.8918	75.45	3878.	2.411	3.090	
#1	-.0002	.4165	-.0222	.0004	.0752	.0212	
#2	-.0002	.4113	-.0068	-.0004	.0778	.0222	

7036

Analysis Report

10/21/05 12:20:49 PM

page 1

Method: 6010B Sample Name: MRL7J33A Operator: AZ
 Run Time: 10/21/05 12:16:40
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0222	.2742	.5017	.0201	.0032	.0037	.0374
SDev	.0249	.0062	.0354	.0004	.0000	.0016	.0011
%RSD	112.2	2.264	7.063	1.863	.0533	41.67	2.916

#1	.0046	.2698	.4767	.0198	.0032	.0048	.0382
#2	.0397	.2786	.5268	.0203	.0032	.0026	.0366

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	5.092	.0710	.0710	.0583	.0533	.0426	5.047
SDev	.002	.0003	.0049	.0005	.0006	.0156	.018
%RSD	.0305	.4515	6.948	.8268	1.136	36.63	.3657

#1	5.093	.0708	.0675	.0580	.0537	.0316	5.060
#2	5.091	.0713	.0745	.0587	.0528	.0536	5.034

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0003	.0400	.0494	5.485	.7751	.0641	5.528
SDev	.0000	.0074	.0061	.403	.0298	.0002	.021
%RSD	.2100	18.61	12.28	7.345	3.844	.3014	.3751

#1	.0003	.0347	.0537	5.769	.7540	.0643	5.543
#2	.0003	.0453	.0452	5.200	.7962	.0640	5.513

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0004	.4306	.0028	.0006	.0768	.0219
SDev	.0001	.0007	.0136	.0000	.0016	.0000
%RSD	20.10	.1719	484.0	3.696	2.096	.1597

#1	.0003	.4311	.0124	.0006	.0757	.0219
#2	.0004	.4301	-.0068	.0007	.0779	.0219

7037

Analysis Report

10/21/05 12:26:31 PM

page 1

Method: 6010B Sample Name: ICSAI

Operator: AZ

Run Time: 10/21/05 12:22:32

Comment: INST.I07

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	478.5	.0149	.0243	.0002	.0000	.0065	-.0059
SDev	5.4	.0204	.0150	.0000	.0001	.0029	.0002
%RSD	1.119	136.8	61.51	7.355	174.2	44.85	3.052

#1	482.2	.0294	.0349	.0002	.0001	.0086	-.0057
#2	474.7	.0005	.0138	.0002	-.0000	.0045	-.0060

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	457.3	.0006	-.0006	.0103	178.8	.0453	490.0
SDev	3.6	.0015	.0016	.0005	2.2	.0335	6.9
%RSD	.7802	271.8	281.6	5.123	1.218	74.06	1.401

#1	459.8	-.0005	-.0017	.0107	180.3	.0216	494.9
#2	454.8	.0016	.0006	.0100	177.3	.0690	485.2

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0007	.0047	-.0001	-.0949	-.0856	-.0127	.4839
SDev	.0026	.0030	.0029	.6321	.1533	.0051	.0207
%RSD	381.3	62.86	2121.	666.2	179.1	39.97	4.285

#1	.0025	.0068	-.0022	-.5418	.0228	-.0163	.4692
#2	-.0011	.0026	.0019	.3521	-.1940	-.0091	.4985

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0019	.2922	-.0104	.0042	.0102	-.0026
SDev	.0002	.0073	.0096	.0006	.0020	.0011
%RSD	8.071	2.501	92.47	12.88	19.23	42.40

#1	-.0020	.2870	-.0036	.0046	.0116	-.0019
#2	-.0018	.2973	-.0172	.0039	.0088	-.0034

7038

Analysis Report

10/21/05 12:30:42 PM

page 1

Method: 6010B Sample Name: ICSABI

Operator: AZ

Run Time: 10/21/05 12:26:34

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	476.9	.8913	.9875	.4634	.4636	.4615	.8947
SDev	.6	.0112	.0557	.0020	.0009	.0005	.0014
%RSD	.1232	1.258	5.643	.4298	.1997	.1014	.1600

#1	477.4	.8992	.9481	.4648	.4643	.4611	.8957
#2	476.5	.8834	1.027	.4620	.4630	.4618	.8937

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	454.8	.4402	.4189	.4783	177.4	.9191	484.7
SDev	.1	.0026	.0042	.0020	.3	.0429	1.7
%RSD	.0255	.5784	1.013	.4227	.1919	4.671	.3600

#1	454.9	.4420	.4219	.4797	177.7	.9495	485.9
#2	454.7	.4384	.4159	.4769	177.2	.8888	483.5

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.4421	.8626	.8408	51.79	3.305	.9257	10.78
SDev	.0021	.0045	.0039	.14	.053	.0015	.02
%RSD	.4738	.5177	.4660	.2670	1.589	.1616	.1924

#1	.4436	.8658	.8380	51.89	3.268	.9246	10.79
#2	.4406	.8595	.8435	51.69	3.342	.9267	10.76

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.4499	3.405	.8325	.9218	.4941	.9213
SDev	.0015	.069	.0450	.0025	.0025	.0037
%RSD	.3264	2.035	5.401	.2754	.4974	.4004

#1	.4509	3.454	.8642	.9236	.4958	.9239
#2	.4488	3.356	.8007	.9200	.4924	.9187

7039

Analysis Report

10/21/05 12:36:35 PM

page 1

Method: 6010B Sample Name: CCV1

Operator: AZ

Run Time: 10/21/05 12:32:26

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	5.090	.9711	.9755	.9710	.9639	.9880	.9662
SDev	.037	.0192	.0365	.0063	.0063	.0078	.0047
%RSD	.7259	1.976	3.743	.6539	.6515	.7915	.4821
#1	5.116	.9575	1.001	.9755	.9683	.9935	.9695
#2	5.064	.9846	.9496	.9665	.9594	.9825	.9630
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5.500	1.100	1.100	1.100	1.100	1.100	1.100
Low	4.500	.9000	.9000	.9000	.9000	.9000	.9000
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	49.88	.9519	.9436	.9597	5.046	.9652	49.39
SDev	.27	.0003	.0130	.0049	.034	.0010	.87
%RSD	.5346	.0345	1.377	.5067	.6814	.1062	1.758
#1	50.07	.9517	.9528	.9632	5.070	.9660	50.00
#2	49.69	.9522	.9344	.9563	5.022	.9645	48.78
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	55.00	1.100	1.100	1.100	5.500	1.100	55.00
Low	45.00	.9000	.9000	.9000	4.500	.9000	45.00
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9528	.9779	.9352	49.92	.9782	.9662	50.28
SDev	.0070	.0089	.0027	.65	.0352	.0062	.08
%RSD	.7402	.9138	.2932	1.307	3.603	.6410	.1650
#1	.9578	.9716	.9372	50.39	1.003	.9705	50.34
#2	.9479	.9842	.9333	49.46	.9533	.9618	50.22
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.100	1.100	1.100	55.00	1.100	1.100	55.00
Low	.9000	.9000	.9000	45.00	.9000	.9000	45.00
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	.9786	.9848	4.814	.9805	.9778	.9727	
SDev	.0065	.0913	.004	.0083	.0056	.0006	
%RSD	.6683	9.272	.0829	.8421	.5676	.0665	
#1	.9833	1.049	4.817	.9863	.9817	.9732	
#2	.9740	.9202	4.811	.9746	.9739	.9722	
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	
High	1.100	1.100	5.500	1.100	1.100	1.100	
Low	.9000	.9000	4.500	.9000	.9000	.9000	

7040

Analysis Report

10/21/05 12:42:17 PM

page 1

 Method: 6010B Sample Name: CCB1
 Run Time: 10/21/05 12:38:18
 Comment: INST.I07
 Mode: CONC Corr. Factor: 1

Operator: AZ

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0092	.0084	-.0030	.0002	-.0001	.0018	.0001
SDev	.0066	.0168	.0161	.0004	.0000	.0010	.0000
%RSD	71.91	200.6	533.3	212.1	.6595	56.83	70.22

#1	-.0045	-.0035	.0084	.0004	-.0001	.0011	.0000
#2	-.0139	.0202	-.0144	-.0001	-.0001	.0026	.0001

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.1000	.0500	.1000	.0050	.0050	.1000	.0050
Low	-.1000	-.0500	-.1000	-.0050	-.0050	-.1000	-.0050

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0005	-.0013	.0006	-.0007	.0004	-.0051	-.0113
SDev	.0016	.0013	.0052	.0024	.0012	.0161	.0071
%RSD	346.9	94.05	895.3	355.0	282.7	318.4	63.16

#1	.0007	-.0005	.0043	.0010	.0013	.0063	-.0062
#2	-.0016	-.0022	-.0031	-.0024	-.0004	-.0165	-.0163

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.000	.0100	.0200	.0100	.1000	.1000	.5000
Low	-1.000	-.0100	-.0200	-.0100	-.1000	-.1000	-.5000

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0000	-.0063	.0021	-.0505	.0006	-.0007	.0147
SDev	.0004	.0015	.0033	1.7440	.0117	.0006	.0207
%RSD	117500.	23.57	160.3	3454.	1847.	84.87	141.4

#1	.0003	-.0074	.0044	1.183	.0089	-.0011	.0293
#2	-.0003	-.0053	-.0003	-1.284	-.0077	-.0003	-.0000

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0100	.0400	.0200	5.000	.1000	.0100	1.000
Low	-.0100	-.0400	-.0200	-5.000	-.1000	-.0100	-1.000

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0001	.0167	-.0009	.0001	-.0016	.0019
SDev	.0001	.0029	.0041	.0013	.0006	.0005
%RSD	141.4	17.64	441.6	1181.	39.50	26.45

#1	-.0000	.0188	-.0039	-.0008	-.0020	.0016
#2	-.0002	.0146	.0020	.0010	-.0011	.0023

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0200	.1000	.2000	.1000	.0100	.0100
Low	-.0200	-.1000	-.2000	-.1000	-.0100	-.0100

7041

Analysis Report

10/21/05 12:46:19 PM

page 1

Method: 6010B Sample Name: IPJ029WB Operator: AZ
 Run Time: 10/21/05 12:42:20
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0007	-.0061	.0129	.0003	-.0002	-.0004	-.0006
SDev	.0079	.0106	.0043	.0000	.0000	.0000	.0002
%RSD	1077.	174.7	33.17	.0049	.3366	.3284	29.68
#1	-.0063	.0014	.0099	.0003	-.0002	-.0004	-.0007
#2	.0049	-.0136	.0160	.0003	-.0002	-.0004	-.0004
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.1000	.0500	.1000	.0050	.0050	.1000	.0050
Low	-.1000	-.0500	-.1000	-.0050	-.0050	-.1000	-.0050
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.0093	-.0009	-.0023	-.0017	.0004	-.0124	-.0337
SDev	.0027	.0019	.0025	.0010	.0006	.0026	.0043
%RSD	29.48	211.2	106.2	56.66	141.0	21.32	12.66
#1	.0112	.0004	-.0006	-.0010	.0000	-.0142	-.0367
#2	.0073	-.0022	-.0041	-.0024	.0008	-.0105	-.0307
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.000	.0100	.0200	.0100	.1000	.1000	.5000
Low	-1.000	-.0100	-.0200	-.0100	-.1000	-.1000	-.5000
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0002	-.0105	-.0008	-.5192	.0064	-.0037	.5352
SDev	.0004	.0015	.0000	.9893	.0109	.0002	.0104
%RSD	212.0	14.14	.0000	190.5	170.2	5.235	1.937
#1	.0001	-.0095	-.0008	.1803	.0140	-.0036	.5425
#2	-.0005	-.0116	-.0008	-1.219	-.0013	-.0038	.5279
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0100	.0400	.0200	5.000	.1000	.0100	1.000
Low	-.0100	-.0400	-.0200	-5.000	-.1000	-.0100	-1.000
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	-.0002	.0052	-.0068	-.0000	-.0034	.0051	
SDev	.0000	.0059	.0041	.0000	.0006	.0001	
%RSD	.0707	113.0	60.94	15.39	18.95	1.527	
#1	-.0002	.0094	-.0038	-.0000	-.0029	.0050	
#2	-.0002	.0010	-.0097	-.0000	-.0038	.0051	
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	
High	.0200	.1000	.2000	.1000	.0100	.0100	
Low	-.0200	-.1000	-.2000	-.1000	-.0100	-.0100	

7042

Analysis Report

10/21/05 12:50:21 PM

page 1

Method: 6010B

Sample Name: IPJ029WL

Operator: AZ

Run Time: 10/21/05 12:46:22

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	9.945	4.564	.9848	.9153	.9838	1.018	.9373
SDev	.061	.063	.0128	.0036	.0038	.003	.0043
%RSD	.6137	1.376	1.301	.3944	.3844	.2575	.4636
#1	9.902	4.519	.9757	.9128	.9811	1.016	.9342
#2	9.988	4.608	.9938	.9179	.9865	1.020	.9403
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	12.00	6.000	1.200	1.200	1.200	1.200	1.200
Low	8.000	4.000	.8000	.8000	.8000	.8000	.8000
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	48.83	.9535	.9412	.9596	10.09	.9773	49.03
SDev	.32	.0054	.0071	.0039	.05	.0066	.11
%RSD	.6548	.5656	.7553	.4055	.4989	.6749	.2254
#1	48.60	.9497	.9362	.9568	10.05	.9819	48.95
#2	49.05	.9573	.9462	.9623	10.13	.9726	49.10
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	60.00	1.200	1.200	1.200	12.00	1.200	60.00
Low	40.00	.8000	.8000	.8000	8.000	.8000	40.00
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.9668	.9621	.9366	50.22	.9424	.9334	49.40
SDev	.0056	.0074	.0039	.04	.0489	.0087	.00
%RSD	.5813	.7737	.4183	.0710	5.185	.9330	.0000
#1	.9628	.9568	.9339	50.25	.9770	.9273	49.40
#2	.9707	.9673	.9394	50.20	.9079	.9396	49.40
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.200	1.200	1.200	60.00	1.200	1.200	60.00
Low	.8000	.8000	.8000	40.00	.8000	.8000	40.00
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	.9610	.9812	.9382	.9921	.9704	.9699	
SDev	.0040	.0065	.0284	.0038	.0037	.0041	
%RSD	.4181	.6570	3.027	.3856	.3823	.4257	
#1	.9581	.9767	.9583	.9894	.9678	.9670	
#2	.9638	.9858	.9182	.9948	.9731	.9728	
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	
High	1.200	1.200	1.200	1.200	1.200	1.200	
Low	.8000	.8000	.8000	.8000	.8000	.8000	

7043

Analysis Report

10/21/05 12:54:24 PM

page 1

Method: 6010B Sample Name: IPJ029WC Operator: AZ
 Run Time: 10/21/05 12:50:25
 Comment: INST.I07
 Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	9.982	4.571	.9763	.9211	.9873	1.026	.9386
SDev	.076	.018	.0098	.0070	.0067	.006	.0064
%RSD	.7635	.3961	1.004	.7570	.6793	.6111	.6836
#1	9.928	4.584	.9833	.9161	.9826	1.022	.9341
#2	10.04	4.558	.9694	.9260	.9920	1.030	.9431
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	12.00	6.000	1.200	1.200	1.200	1.200	1.200
Low	8.000	4.000	.8000	.8000	.8000	.8000	.8000
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	49.15	.9526	.9379	.9630	10.12	.9786	49.43
SDev	.27	.0092	.0044	.0088	.05	.0248	.17
%RSD	.5547	.9649	.4646	.9081	.5210	2.537	.3360
#1	48.96	.9461	.9348	.9568	10.08	.9610	49.55
#2	49.35	.9591	.9410	.9692	10.16	.9961	49.31
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	60.00	1.200	1.200	1.200	12.00	1.200	60.00
Low	40.00	.8000	.8000	.8000	8.000	.8000	40.00
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9706	.9652	.9393	51.22	.9878	.9329	49.85
SDev	.0045	.0030	.0084	.32	.0009	.0056	.61
%RSD	.4606	.3083	.8968	.6271	.0904	.6021	1.227
#1	.9675	.9631	.9333	51.44	.9884	.9289	49.41
#2	.9738	.9673	.9452	50.99	.9871	.9368	50.28
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.200	1.200	1.200	60.00	1.200	1.200	60.00
Low	.8000	.8000	.8000	40.00	.8000	.8000	40.00
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	.9695	.9723	.9344	.9985	.9729	.9723	
SDev	.0078	.0326	.0149	.0070	.0065	.0056	
%RSD	.8025	3.358	1.594	.7049	.6680	.5749	
#1	.9640	.9953	.9239	.9935	.9683	.9683	
#2	.9750	.9492	.9449	1.003	.9775	.9762	
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	
High	1.200	1.200	1.200	1.200	1.200	1.200	
Low	.8000	.8000	.8000	.8000	.8000	.8000	

7044

Analysis Report

10/21/05 01:00:07 PM

page 1

Method: 6010B Sample Name: J114-02A Operator: AZ
 Run Time: 10/21/05 12:56:08
 Comment: INST.I07
 Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	9.804	4.374	.9832	.9472	.9414	1.222	.9103
SDev	.032	.036	.0011	.0011	.0014	.004	.0111
%RSD	.3297	.8296	.1144	.1180	.1516	.3414	1.217
#1	9.781	4.348	.9840	.9464	.9404	1.219	.9024
#2	9.827	4.399	.9824	.9480	.9424	1.225	.9181
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	196.3	.9089	.8933	.9364	10.68	.9422	94.65
SDev	.7	.0070	.0034	.0029	.03	.0016	.03
%RSD	.3325	.7669	.3822	.3119	.2655	.1706	.0286
#1	195.9	.9039	.8909	.9343	10.66	.9434	94.63
#2	196.8	.9138	.8958	.9384	10.70	.9411	94.67
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.586	.9231	.8902	51.41	.9297	.8540	82.90
SDev	.004	.0060	.0006	.37	.0552	.0050	.00
%RSD	.2815	.6452	.0660	.7142	5.933	.5892	.0000
#1	1.583	.9273	.8906	51.67	.8907	.8504	82.90
#2	1.589	.9189	.8898	51.15	.9688	.8575	82.90
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	1.556	.9710	.8925	.9651	.9346	1.068	
SDev	.001	.0029	.0328	.0017	.0011	.000	
%RSD	.0754	.2936	3.674	.1722	.1210	.0156	
#1	1.556	.9689	.8693	.9639	.9338	1.067	
#2	1.557	.9730	.9157	.9663	.9354	1.068	

7045

Analysis Report

10/21/05 01:04:10 PM

page 1

Method: 6010B Sample Name: J114-02M

Operator: AZ

Run Time: 10/21/05 13:00:10

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	9.732	4.439	1.007	.9377	.9337	1.202	.9051
SDev	.017	.050	.024	.0036	.0030	.003	.0010
%RSD	.1739	1.127	2.351	.3851	.3207	.2615	.1144

#1	9.744	4.403	.9901	.9403	.9358	1.205	.9044
#2	9.720	4.474	1.024	.9352	.9316	1.200	.9058

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	195.6	.8952	.8851	.9278	10.59	.9243	93.49
SDev	.1	.0054	.0033	.0044	.03	.0037	.30
%RSD	.0290	.6024	.3698	.4712	.3300	.4028	.3185

#1	195.7	.8990	.8874	.9309	10.62	.9269	93.28
#2	195.6	.8914	.8828	.9247	10.57	.9217	93.70

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.575	.9105	.8798	51.69	.9483	.9029	81.99
SDev	.002	.0089	.0114	.02	.0108	.0035	.00
%RSD	.1466	.9811	1.291	.0394	1.136	.3861	.0000

#1	1.577	.9168	.8879	51.67	.9559	.9054	81.99
#2	1.573	.9042	.8718	51.70	.9407	.9005	81.99

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.542	.8931	.9014	.9568	.9274	1.058
SDev	.005	.0031	.0342	.0033	.0049	.005
%RSD	.3015	.3468	3.795	.3413	.5243	.4888

#1	1.545	.8909	.8772	.9591	.9308	1.062
#2	1.539	.8953	.9256	.9544	.9239	1.055

7046

Analysis Report

10/21/05 01:08:12 PM

page 1

Method: 6010B

Sample Name: J114-02S

Operator: AZ

Run Time: 10/21/05 13:04:13

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem..	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	10.11	4.580	1.020	.9795	.9695	1.244	.9303
SDev	.07	.057	.008	.0040	.0049	.003	.0032
%RSD	.7406	1.255	.8315	.4063	.5074	.2090	.3460

#1	10.06	4.540	1.014	.9767	.9660	1.246	.9281
#2	10.16	4.621	1.026	.9823	.9730	1.242	.9326

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	201.6	.9301	.9143	.9659	10.97	.9398	96.04
SDev	1.0	.0047	.0063	.0029	.04	.0045	.58
%RSD	.4889	.5108	.6868	.3023	.4014	.4774	.6043

#1	200.9	.9268	.9098	.9639	10.94	.9367	95.63
#2	202.3	.9335	.9187	.9680	11.00	.9430	96.45

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.628	.9463	.9213	52.76	.9456	.9346	85.26
SDev	.008	.0030	.0194	.84	.0289	.0037	.64
%RSD	.4864	.3146	2.105	1.585	3.051	.3938	.7539

#1	1.622	.9442	.9075	52.16	.9252	.9320	84.81
#2	1.634	.9484	.9350	53.35	.9660	.9372	85.72

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.605	.9850	.9027	.9887	.9655	1.090
SDev	.006	.0614	.0325	.0041	.0086	.006
%RSD	.3984	6.228	3.601	.4104	.8866	.5243

#1	1.600	1.028	.9257	.9858	.9595	1.086
#2	1.609	.9416	.8797	.9916	.9716	1.094

7047

Analysis Report

10/21/05 01:13:55 PM

page 1

Method: 6010B Sample Name: J114-02

Run Time: 10/21/05 13:09:56

Operator: AZ

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0162	.0041	-.0160	.0553	-.0000	.2245	.0006
SDev	.0060	.0075	.0226	.0001	.0001	.0037	.0003
%RSD	37.17	185.3	141.1	.2211	154.8	1.625	55.92
#1	-.0204	-.0013	-.0000	.0552	-.0001	.2219	.0008
#2	-.0119	.0094	-.0320	.0553	.0000	.2271	.0004
Elem	✓Ca	Cr	Co	Cu	✓Fe	Pb	✓Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	157.0	-.0011	.0004	-.0022	1.073	-.0038	47.37
SDev	.5	.0016	.0004	.0010	.002	.0180	.18
%RSD	.3189	138.6	93.88	44.42	.2235	479.1	.3873
#1	156.6	-.0023	.0001	-.0015	1.075	.0090	47.50
#2	157.3	-.0000	.0007	-.0029	1.071	-.0165	47.24
Elem	Mn	Mo	Ni	✓K	Se	Ag	✓Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.6949	-.0063	-.0001	.3461	-.0256	-.0021	35.26
SDev	.0020	.0045	.0033	2.050	.0316	.0008	.18
%RSD	.2897	70.71	2404.	592.2	123.4	36.60	.4999
#1	.6935	-.0032	.0022	1.796	-.0479	-.0027	35.38
#2	.6963	-.0095	-.0025	-1.103	-.0033	-.0016	35.13
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	.6495	.0063	-.0173	.0001	-.0030	.1433	
SDev	.0008	.0073	.0136	.0002	.0019	.0021	
%RSD	.1286	116.6	78.50	343.0	63.86	1.471	
#1	.6501	.0115	-.0077	-.0001	-.0016	.1418	
#2	.6489	.0011	-.0269	.0002	-.0043	.1448	

7048

Analysis Report

10/21/05 01:17:56 PM

page 1

Method: 6010B Sample Name: J114-02J Operator: AZ
 Run Time: 10/21/05 13:13:58
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	✓ Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.0010	.0063	-.0029	.0114	-.0001	.0458	.0007
SDev	.0263	.0035	.0118	.0003	.0000	.0016	.0005
%RSD	2624.	55.61	405.8	2.187	2.588	3.417	71.39

#1	.0196	.0088	.0054	.0116	-.0001	.0469	.0011
#2	-.0176	.0038	-.0112	.0112	-.0001	.0447	.0004

Elem	✓ Ca	Cr	Co	Cu	✓ Fe	Pb	✓ Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	31.72	-.0014	-.0032	-.0003	.2179	.0078	9.383
SDev	.01	.0013	.0051	.0019	.0033	.0111	.112
%RSD	.0244	93.60	157.9	652.8	1.521	141.6	1.191

#1	31.72	-.0005	.0004	.0011	.2203	.0157	9.304
#2	31.71	-.0022	-.0068	-.0017	.2156	-.0000	9.462

Elem	Mn	Mo	Ni	✓ K	Se	Ag	✓ Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.1407	-.0042	.0033	-.1010	.0254	-.0001	7.405
SDev	.0006	.0015	.0027	.1530	.0199	.0002	.021
%RSD	.4100	35.36	82.50	151.5	78.23	159.2	.2800

#1	.1411	-.0053	.0053	-.2091	.0395	-.0003	7.390
#2	.1402	-.0032	.0014	.0072	.0114	.0000	7.419

Elem	Sr	Tl	Sn	Ti	V	✓ Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.1291	.0094	-.0077	.0009	-.0007	.0313
SDev	.0000	.0088	.0000	.0004	.0025	.0009
%RSD	.0003	93.99	.1304	40.65	368.1	2.810

#1	.1291	.0156	-.0077	.0011	.0011	.0307
#2	.1291	.0031	-.0077	.0006	-.0024	.0320

7049

Analysis Report

10/21/05 01:21:58 PM

page 1

Method: 6010B Sample Name: J114-03 Operator: AZ
Run Time: 10/21/05 13:17:59
Comment: INST.107
Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0071	.0012	.0082	.0527	.0000	.2138	.0010
SDev	.0021	.0118	.0398	.0005	.0001	.0000	.0016
%RSD	29.99	966.2	484.5	.9468	136.8	.0040	159.9

#1	.0056	.0096	-.0199	.0531	.0001	.2138	.0022
#2	.0086	-.0071	.0363	.0524	.0000	.2138	-.0001

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	152.8	.0009	.0041	.0029	.9765	.0065	43.84
SDev	.2	.0019	.0062	.0034	.0033	.0087	1.28
%RSD	.1607	218.9	149.6	115.4	.3402	134.1	2.931

#1	152.6	.0022	.0085	.0053	.9789	.0127	42.93
#2	153.0	-.0005	-.0002	.0005	.9742	.0003	44.75

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.6826	-.0063	.0035	3.537	-.0223	-.0001	33.38
SDev	.0013	.0074	.0018	1.382	.0434	.0014	.16
%RSD	.1897	117.9	50.91	39.07	194.9	1864.	.4659

#1	.6835	-.0011	.0022	4.515	-.0530	.0009	33.49
#2	.6817	-.0116	.0047	2.560	.0084	-.0010	33.27

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.6122	.0134	.0173	.0021	.0014	.4145
SDev	.0027	.0302	.0354	.0000	.0042	.0006
%RSD	.4386	225.4	204.1	.0432	292.6	.1390

#1	.6141	.0348	-.0077	.0021	.0044	.4141
#2	.6103	-.0080	.0423	.0021	-.0015	.4150

Analysis Report

10/21/05 01:26:00 PM

page 1

 Method: 6010B Sample Name: J114-04
 Run Time: 10/21/05 13:22:01
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Operator: AZ

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.0075	.0020	-.0064	.0386	.0000	.2886	.0001
SDev	.0052	.0028	.0409	.0003	.0001	.0057	.0005
%RSD	69.77	139.7	634.8	.6407	11970.	1.988	471.5
#1	.0038	.0000	.0225	.0388	-.0001	.2927	-.0002
#2	.0112	.0040	-.0353	.0384	.0001	.2846	.0004
Elem	✓Ca	Cr	Co	Cu	✓Fe	Pb	✓Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	236.0	.0015	.0032	.0005	.6569	.0041	87.02
SDev	.4	.0003	.0032	.0010	.0051	.0037	.58
%RSD	.1567	20.61	99.71	211.1	.7826	90.03	.6617
#1	236.3	.0018	.0009	.0011	.6605	.0067	87.43
#2	235.7	.0013	.0054	-.0002	.6532	.0015	86.62
Elem	Mn	Mo	Ni	✓K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.6641	-.0011	.0050	2.081	.0137	-.0001	30.95
SDev	.0032	.0030	.0000	1.923	.0145	.0010	.34
%RSD	.4764	282.1	.0000	92.40	106.1	819.1	1.106
#1	.6664	-.0032	.0050	.7212	.0034	-.0008	31.19
#2	.6619	.0011	.0050	3.440	.0239	.0006	30.70
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	.8287	.0277	.0087	.0034	-.0011	.0685	
SDev	.0089	.0501	.0232	.0009	.0028	.0000	
%RSD	1.069	181.0	267.4	25.50	251.8	.0602	
#1	.8350	.0632	-.0077	.0028	-.0031	.0685	
#2	.8225	-.0077	.0250	.0040	.0009	.0685	

7051

Analysis Report

10/21/05 01:31:43 PM

page 1

Method: 6010B Sample Name: CCV2

Operator: AZ

Run Time: 10/21/05 13:27:44

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem..	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	4.869	.9616	.9553	.9329	.9309	.9551	.9493
SDev	.004	.0059	.0140	.0010	.0022	.0052	.0046
%RSD	.0832	.6126	1.465	.1067	.2378	.5471	.4810
#1	4.871	.9574	.9454	.9321	.9294	.9514	.9460
#2	4.866	.9657	.9652	.9336	.9325	.9588	.9525
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5.500	1.100	1.100	1.100	1.100	1.100	1.100
Low	4.500	.9000	.9000	.9000	.9000	.9000	.9000
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	48.92	.9224	.9187	.9206	4.897	.9439	48.14
SDev	.13	.0016	.0037	.0019	.009	.0090	.09
%RSD	.2667	.1723	.4019	.2108	.1848	.9497	.1818
#1	48.83	.9212	.9161	.9192	4.890	.9502	48.08
#2	49.02	.9235	.9213	.9220	4.903	.9376	48.20
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	55.00	1.100	1.100	1.100	5.500	1.100	55.00
Low	45.00	.9000	.9000	.9000	4.500	.9000	45.00
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9254	.9463	.9236	49.20	.9089	.9426	48.40
SDev	.0019	.0060	.0004	.08	.0190	.0015	.08
%RSD	.2022	.6294	.0424	.1658	2.086	.1642	.1714
#1	.9240	.9421	.9239	49.26	.9224	.9415	48.34
#2	.9267	.9505	.9233	49.15	L.8955	.9437	48.46
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.100	1.100	1.100	55.00	1.100	1.100	55.00
Low	.9000	.9000	.9000	45.00	.9000	.9000	45.00
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	.9399	.9718	4.663	.9460	.9444	.9475	
SDev	.0014	.0486	.008	.0011	.0005	.0029	
%RSD	.1438	5.004	.1755	.1172	.0489	.3072	
#1	.9389	.9374	4.657	.9452	.9441	.9455	
#2	.9408	1.006	4.669	.9468	.9448	.9496	
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	
High	1.100	1.100	5.500	1.100	1.100	1.100	
Low	.9000	.9000	4.500	.9000	.9000	.9000	

7052

Analysis Report

10/21/05 01:37:26 PM

page 1

Method: 6010B Sample Name: CCB2

Operator: AZ

Run Time: 10/21/05 13:33:27

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0029	.0128	-.0091	.0006	-.0001	.0052	-.0002
SDev	.0013	.0143	.0075	.0000	.0000	.0037	.0001
%RSD	45.87	111.4	82.47	.0044	1.385	70.79	61.14

#1	.0038	.0229	-.0145	.0006	-.0001	.0077	-.0003
#2	.0019	.0027	-.0038	.0006	-.0001	.0026	-.0001

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.1000	.0500	.1000	.0050	.0050	.1000	.0050
Low	-.1000	-.0500	-.1000	-.0050	-.0050	-.1000	-.0050

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0019	-.0009	-.0015	-.0017	-.0004	.0056	-.0123
SDev	.0058	.0013	.0012	.0010	.0006	.0021	.0000
%RSD	311.2	140.9	84.38	56.62	140.8	37.82	.0305

#1	.0022	-.0018	-.0023	-.0010	-.0009	.0071	-.0123
#2	-.0060	-.0000	-.0006	-.0024	-.0000	.0041	-.0123

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.000	.0100	.0200	.0100	.1000	.1000	.5000
Low	-1.000	-.0100	-.0200	-.0100	-.1000	-.1000	-.5000

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0003	-.0053	.0037	.4832	-.0511	-.0036	.2199
SDev	.0000	.0000	.0069	.7445	.0090	.0043	.3110
%RSD	.0757	.0037	183.3	154.1	17.64	119.7	141.4

#1	-.0003	-.0053	-.0011	1.010	-.0448	-.0066	-.0000
#2	-.0003	-.0053	.0086	-.0433	-.0575	-.0005	.4399

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0100	.0400	.0200	5.000	.1000	.0100	1.000
Low	-.0100	-.0400	-.0200	-5.000	-.1000	-.0100	-1.000

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0001	.0099	-.0096	.0006	-.0011	.0019
SDev	.0000	.0258	.0081	.0009	.0010	.0013
%RSD	.4505	260.4	84.68	145.2	91.46	68.01

#1	.0001	.0282	-.0153	-.0000	-.0019	.0029
#2	.0001	-.0083	-.0038	.0013	-.0004	.0010

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0200	.1000	.2000	.1000	.0100	.0100
Low	-.0200	-.1000	-.2000	-.1000	-.0100	-.0100

7053

Analysis Report

10/21/05 01:41:27 PM

page 1

Method: 6010B

Sample Name: J114-05

Run Time: 10/21/05 13:37:28

Operator: AZ

Comment: INST.I07

Mode: CONC Corr. Factor: 1

Elem..	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0069	.0082	.0061	.0885	-.0001	.3620	.0004
SDev	.0046	.0009	.0484	.0000	.0001	.0052	.0001
%RSD	66.54	10.89	796.0	.0024	119.7	1.442	31.64
#1	.0037	.0076	.0403	.0885	-.0000	.3583	.0005
#2	.0102	.0088	-.0281	.0885	-.0002	.3657	.0003
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	217.8	-.0013	-.0028	.0002	.0261	.0097	88.73
SDev	.4	.0016	.0003	.0010	.0000	.0137	.13
%RSD	.2063	126.3	9.772	401.6	.0307	141.4	.1469
#1	217.5	-.0001	-.0030	.0009	.0261	.0194	88.63
#2	218.1	-.0024	-.0026	-.0004	.0261	.0000	88.82
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	1.678	-.0032	.0587	2.647	-.0333	-.0007	35.85
SDev	.001	.0000	.0031	.663	.0163	.0015	.02
%RSD	.0857	.0015	5.337	25.05	48.81	208.2	.0578
#1	1.677	-.0032	.0609	3.115	-.0448	-.0018	35.84
#2	1.679	-.0032	.0565	2.178	-.0218	.0004	35.87
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	.6977	.0362	-.0135	.0026	.0163	.0197	
SDev	.0007	.0030	.0000	.0002	.0016	.0010	
%RSD	.0972	8.192	.0153	8.627	9.607	4.951	
#1	.6982	.0341	-.0135	.0024	.0174	.0204	
#2	.6972	.0383	-.0135	.0028	.0152	.0190	

7054

Analysis Report

10/21/05 01:45:29 PM

page 1

Method: 6010B

Sample Name: J114-06

Run Time: 10/21/05 13:41:30

Operator: AZ

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.0028	.0028	.0100	.2127	-.0001	.3079	-.0007
SDev	.0092	.0041	.0075	.0010	.0000	.0016	.0001
%RSD	324.1	143.9	75.49	.4660	2.171	.5083	18.25
#1	-.0037	.0057	.0046	.2120	-.0001	.3090	-.0006
#2	.0094	-.0000	.0153	.2134	-.0001	.3068	-.0008
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	221.2	-.0007	.0014	-.0008	1.304	.0097	67.09
SDev	1.1	.0016	.0038	.0010	.002	.0264	.65
%RSD	.5066	223.9	279.3	125.5	.1408	272.3	.9652
#1	220.4	.0004	.0041	-.0001	1.303	.0284	66.64
#2	221.9	-.0018	-.0013	-.0015	1.306	-.0090	67.55
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.9769	-.0032	.0030	1.990	.0184	-.0005	36.33
SDev	.0050	.0000	.0008	.184	.0036	.0008	.39
%RSD	.5152	.1064	25.71	9.223	19.77	164.7	1.084
#1	.9733	-.0032	.0036	2.120	.0158	-.0010	36.06
#2	.9804	-.0032	.0025	1.861	.0209	.0001	36.61
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avg	.9706	.0260	.0010	.0027	-.0009	.0053	
SDev	.0043	.0398	.0122	.0003	.0021	.0007	
%RSD	.4424	153.2	1270.	10.87	240.2	12.73	
#1	.9676	.0541	-.0077	.0025	.0006	.0058	
#2	.9736	-.0022	.0096	.0029	-.0023	.0048	

7055

Analysis Report

10/21/05 01:49:31 PM

page 1

Method: 6010B Sample Name: J114-07

Run Time: 10/21/05 13:45:32

Operator: AZ

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0046	-.0003	.0047	.0293	-.0001	.3542	-.0008
SDev	.0131	.0158	.0161	.0003	.0000	.0031	.0015
%RSD	284.2	5276.	343.4	.8489	.9724	.8825	183.4
#1	-.0138	-.0115	-.0067	.0292	-.0001	.3564	.0002
#2	.0046	.0109	.0161	.0295	-.0001	.3520	-.0019
Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	221.9	-.0009	-.0006	-.0001	2.569	-.0023	89.71
SDev	.0	.0013	.0012	.0005	.007	.0005	.56
%RSD	.0012	140.6	224.1	401.4	.2581	22.89	.6274
#1	221.9	-.0018	.0003	.0002	2.574	-.0019	90.11
#2	221.9	-.0000	-.0014	-.0005	2.564	-.0026	89.31
Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9936	-.0053	.0733	1.893	-.0162	-.0012	34.19
SDev	.0001	.0060	.0002	1.015	.0190	.0017	.00
%RSD	.0145	113.0	.2673	53.60	117.4	140.3	.0000
#1	.9937	-.0095	.0734	2.611	-.0296	-.0025	34.19
#2	.9935	-.0011	.0731	1.176	-.0028	-.0000	34.19
Elem	Sr	Tl	Sn	Ti	V	Zn	
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Avge	.7254	.0174	.0058	.0025	.0039	.0328	
SDev	.0023	.0324	.0191	.0006	.0010	.0003	
%RSD	.3153	185.8	331.3	22.34	25.41	.9080	
#1	.7271	.0404	-.0077	.0021	.0032	.0330	
#2	.7238	-.0055	.0193	.0029	.0045	.0326	

7056

Analysis Report

10/21/05 01:53:32 PM

page 1

Method: 6010B Sample Name: J114-09

Run Time: 10/21/05 13:49:33

Operator: AZ

Comment: INST.I07

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	-.0037	.0223	.0033	.4598	-.0001	.2843	-.0001
SDev	.0053	.0009	.0150	.0016	.0000	.0010	.0015
%RSD	142.1	3.889	459.4	.3514	.2333	.3652	1081.

#1	.0000	.0229	.0139	.4586	-.0001	.2851	-.0012
#2	-.0075	.0217	-.0074	.4609	-.0001	.2836	.0009

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	198.0	-.0002	-.0010	.0012	3.926	-.0101	56.18
SDev	.7	.0009	.0022	.0010	.015	.0100	.84
%RSD	.3668	515.6	228.4	78.15	.3843	99.63	1.492

#1	197.5	.0005	-.0025	.0019	3.915	-.0172	55.59
#2	198.6	-.0009	.0006	.0006	3.936	-.0030	56.78

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.9515	.0010	-.0024	1.478	.0303	-.0020	47.51
SDev	.0037	.0030	.0049	1.632	.0045	.0043	.03
%RSD	.3932	286.2	208.0	110.4	14.79	213.7	.0655

#1	.9488	-.0011	-.0058	2.632	.0271	.0010	47.54
#2	.9541	.0031	.0011	.3245	.0335	-.0050	47.49

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	1.068	.0108	-.0009	.0028	-.0003	.0289
SDev	.004	.0302	.0177	.0012	.0002	.0009
%RSD	.3312	280.4	1974.	41.44	70.64	3.223

#1	1.065	-.0106	.0116	.0020	-.0005	.0282
#2	1.070	.0321	-.0134	.0036	-.0002	.0296

7057

Analysis Report

10/21/05 01:59:15 PM

page 1

Method: 6010B Sample Name: J114-1X0 Operator: AZ
 Run Time: 10/21/05 13:55:16 AZ 10/21/05
 Comment: INST.107
 Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0106	.0086	-.0223	.6118	-.0002	.2652	.0003
SDev	.0073	.0055	.0043	.0017	.0001	.0037	.0002
%RSD	68.48	64.43	19.22	.2844	47.77	1.376	48.18

#1	-.0158	.0047	-.0253	.6106	-.0002	.2626	.0002
#2	-.0055	.0125	-.0193	.6130	-.0001	.2678	.0005

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	201.5	-.0007	.0015	-.0006	1.937	.0011	72.74
SDev	.8	.0009	.0012	.0010	.005	.0121	.22
%RSD	.3754	134.8	80.48	153.2	.2340	1091.	.3091

#1	201.0	-.0014	.0024	.0001	1.934	-.0075	72.58
#2	202.0	-.0000	.0007	-.0013	1.940	.0097	72.90

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	1.179	-.0032	.0082	2.304	-.0114	-.0016	32.06
SDev	.002	.0030	.0006	.535	.0235	.0033	.05
%RSD	.2074	94.09	7.191	23.24	206.7	201.7	.1617

#1	1.177	-.0011	.0086	2.683	-.0280	.0007	32.02
#2	1.181	-.0053	.0078	1.926	.0052	-.0040	32.10

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9279	-.0124	.0096	.0025	-.0004	.0651
SDev	.0016	.0479	.0109	.0005	.0007	.0004
%RSD	.1678	385.5	113.1	18.93	166.6	.6077

#1	.9268	.0215	.0019	.0028	.0001	.0648
#2	.9290	-.0463	.0174	.0022	-.0010	.0654

7058

Analysis Report

10/21/05 02:03:17 PM

page 1

Method: 6010B

 Sample Name: ~~J122-02~~

Operator: AZ

Run Time: 10/21/05 13:59:18

AZ 10/21/05

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.0047	.0188	.0068	.0144	-.0001	.3550	-.0008
SDev	.0117	.0108	.0043	.0002	.0001	.0026	.0003
%RSD	248.4	57.14	62.51	1.700	147.9	.7376	39.46

#1	-.0036	.0264	.0038	.0142	.0000	.3531	-.0006
#2	.0130	.0112	.0099	.0145	-.0001	.3568	-.0010

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	260.7	.0002	.0023	.0007	.0141	.0084	104.7
SDev	1.1	.0003	.0019	.0005	.0009	.0114	.5
%RSD	.4072	170.8	83.25	73.50	6.333	135.6	.4886

#1	260.0	.0004	.0037	.0003	.0147	.0003	104.4
#2	261.5	-.0000	.0009	.0010	.0135	.0164	105.1

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.5513	-.0032	.0055	3.375	.0261	.0002	28.45
SDev	.0019	.0089	.0043	.143	.0515	.0004	.04
%RSD	.3391	282.8	77.78	4.231	196.9	184.0	.1458

#1	.5499	-.0095	.0086	3.274	.0626	-.0001	28.42
#2	.5526	.0032	.0025	3.476	-.0103	.0005	28.48

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avg	.8003	.0047	-.0134	.0042	-.0002	.0585
SDev	.0007	.0251	.0081	.0008	.0028	.0003
%RSD	.0912	532.1	60.53	20.16	1146.	.4537

#1	.7998	-.0130	-.0192	.0036	-.0022	.0583
#2	.8009	.0224	-.0077	.0048	.0017	.0586

7059

Analysis Report

10/21/05 02:12:43 PM

page 1

Method: 6010B Sample Name: J122-02

Operator: AZ

Run Time: 10/21/05 14:08:44

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.7502	.0143	1.041	.7369	-.0001	.2453	.1627
SDev	.0087	.0030	.095	.0098	.0001	.0027	.0001
%RSD	1.162	21.13	9.104	1.335	107.0	1.083	.0291

#1	.7441	.0122	1.108	.7438	-.0000	.2471	.1628
#2	.7564	.0164	.9744	.7299	-.0001	.2434	.1627

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	135.1	.0065	.0033	.0072	26.85	-.0086	41.07
SDev	.8	.0013	.0032	.0024	.26	.0024	1.11
%RSD	.5751	19.45	95.70	33.00	.9605	27.85	2.707

#1	135.6	.0056	.0011	.0055	27.04	-.0069	41.86
#2	134.6	.0073	.0055	.0088	26.67	-.0103	40.28

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	1.031	-.0054	.0068	24.63	.0824	-.0010	2209.
SDev	.008	.0089	.0041	.63	.0517	.0046	29.
%RSD	.7858	166.6	60.61	2.567	62.65	446.8	1.324

#1	1.037	.0010	.0097	24.18	.0459	-.0043	2230.
#2	1.025	-.0117	.0039	25.08	.1190	.0022	2189.

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	1.304	.0130	.0373	.0746	.0159	.0854
SDev	.017	.0003	.0014	.0003	.0003	.0004
%RSD	1.282	2.496	3.617	.3831	2.132	.4432

#1	1.316	.0128	.0383	.0748	.0156	.0852
#2	1.292	.0132	.0364	.0744	.0161	.0857

7060

Analysis Report

10/21/05 02:18:26 PM

page 1

Method: 6010B Sample Name: CCV2

Operator: AZ

Run Time: 10/21/05 14:14:27

Comment: INST.107

Mode: CONC Corr. Factor: 1

Elem	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	4.971	.9674	.9323	.9585	.9447	.9791	.9593
SDev	.020	.0186	.0269	.0026	.0026	.0068	.0012
%RSD	.4073	1.919	2.886	.2728	.2793	.6939	.1272

#1	4.985	.9806	.9133	.9603	.9466	.9839	.9585
#2	4.957	.9543	.9513	.9566	.9429	.9743	.9602

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	5.500	1.100	1.100	1.100	1.100	1.100	1.100
Low	4.500	.9000	.9000	.9000	.9000	.9000	.9000

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	49.27	.9315	.9218	.9388	4.963	.9687	48.80
SDev	.07	.0038	.0036	.0005	.014	.0256	.16
%RSD	.1393	.4082	.3859	.0516	.2854	2.647	.3292

#1	49.32	.9289	.9243	.9384	4.973	.9869	48.91
#2	49.22	.9342	.9193	.9391	4.953	.9506	48.68

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	55.00	1.100	1.100	1.100	5.500	1.100	55.00
Low	45.00	.9000	.9000	.9000	4.500	.9000	45.00

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9340	.9558	.9405	50.54	.9492	.9517	49.00
SDev	.0009	.0074	.0012	.27	.0127	.0004	.01
%RSD	.0927	.7789	.1250	.5247	1.333	.0409	.0212

#1	.9346	.9610	.9397	50.73	.9581	.9519	49.00
#2	.9334	.9505	.9413	50.36	.9402	.9514	48.99

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.100	1.100	1.100	55.00	1.100	1.100	55.00
Low	.9000	.9000	.9000	45.00	.9000	.9000	45.00

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.9613	.9616	4.664	.9641	.9569	.9536
SDev	.0032	.0287	.004	.0022	.0037	.0038
%RSD	.3385	2.984	.0887	.2266	.3838	.4018

#1	.9636	.9819	4.667	.9656	.9595	.9563
#2	.9590	.9413	4.661	.9626	.9543	.9509

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.100	1.100	5.500	1.100	1.100	1.100
Low	.9000	.9000	4.500	.9000	.9000	.9000

7061

Analysis Report

10/21/05 02:24:09 PM

page 1

Method: 6010B Sample Name: CCB2

Operator: AZ

Run Time: 10/21/05 14:20:10

Comment: INST.I07

Mode: CONC Corr. Factor: 1

Elem.	Al	Sb	As	Ba	Be	B	Cd
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0071	.0087	-.0053	.0009	-.0002	.0015	-.0002
SDev	.0034	.0023	.0043	.0004	.0000	.0016	.0011
%RSD	47.14	26.25	80.70	42.43	.9307	107.0	455.3

#1	.0047	.0104	-.0023	.0006	-.0002	.0026	.0005
#2	.0095	.0071	-.0084	.0011	-.0002	.0004	-.0010

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.1000	.0500	.1000	.0050	.0050	.1000	.0050
Low	-.1000	-.0500	-.1000	-.0050	-.0050	-.1000	-.0050

Elem	Ca	Cr	Co	Cu	Fe	Pb	Mg
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	-.0040	.0022	.0015	.0000	.0006	-.0013	-.0002
SDev	.0020	.0019	.0003	.0024	.0033	.0151	.0173
%RSD	49.62	85.05	17.50	80220.	518.8	1132.	10890.

#1	-.0026	.0036	.0017	.0017	.0030	.0093	.0120
#2	-.0055	.0009	.0014	-.0017	-.0017	-.0120	-.0124

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	1.000	.0100	.0200	.0100	.1000	.1000	.5000
Low	-1.000	-.0100	-.0200	-.0100	-.1000	-.1000	-.5000

Elem	Mn	Mo	Ni	K	Se	Ag	Na
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0000	-.0074	.0047	1.118	.0351	-.0022	-.0000
SDev	.0004	.0030	.0051	.122	.0515	.0039	.0000
%RSD	70080.	40.41	108.1	10.95	146.5	176.8	.0000

#1	-.0003	-.0053	.0083	1.031	-.0013	.0005	-.0000
#2	.0003	-.0095	.0011	1.204	.0716	-.0049	-.0000

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0100	.0400	.0200	5.000	.1000	.0100	1.000
Low	-.0100	-.0400	-.0200	-5.000	-.1000	-.0100	-1.000

Elem	Sr	Tl	Sn	Ti	V	Zn
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Avge	.0001	-.0036	.0029	.0015	-.0009	.0011
SDev	.0000	.0302	.0041	.0007	.0018	.0003
%RSD	.1555	828.0	140.7	47.25	194.3	23.76

#1	.0001	.0177	.0058	.0010	.0003	.0009
#2	.0001	-.0250	.0000	.0020	-.0022	.0012

Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass
High	.0200	.1000	.2000	.1000	.0100	.0100
Low	-.0200	-.1000	-.2000	-.1000	-.0100	-.0100

7062

DIGESTION LOG FOR ICP METALS

SOP ☐ EMAX-3005 Rev. No. 2 ☒ EMAX-3010 Rev. No. 2 ☐ EMAX-3050 Rev. No. 2 ☐ EMAX-CLP-TAL ☐

Matrix: WATER Start Date: 10-20-05 Time: 18:30 Temp: 90°C Ending Date: 10-20-05 Time: 18:30 Temp: 90°C Book # EIP-048

Sample Prep ID	Lab Sample ID	Matrix Description		Turbidity <1 NTU	Sample Amount (g/ml)	pH	Extract Volume (ml)	Digestate Description		Standards	ID	Amount Added (ml)
		Color	Texture / Clarity					Artifacts	Color			
01	IPJ029-WB				50	-	50			LCS-1	SMIA-09-42	0.5
02	-WL				50	-	50			LCS-2	SMIA-09-43	0.5
03	-WL				50	-	50			LCS-3	SMIA-09-44	0.5
04	J108-02				50	42	50			MS		
05	-03				50		50			Reagent		
06	-04				50		50			HNO ₃	SWIA-03-120	1.5+1.5
07	-05				50		50			HCl	SWIA-03-115	2.5
08	-06				50		50			H ₂ O ₂	NIA	
09	-07				50		50			HNO ₃ (1:1)	NIA	
10	-08				50		50			Digestate Location	ICP LAB	
11	-09				50		50			Extract Location		
12	-10				50		50			Legend:		
13	J114-02				50		50			Texture		
14	-02M				50		50			Coarse		
15	-02S				50		50			Clear		
16	-03				50		50			rocks		
17	-04				50		50			blue		
18	-05				50		50			Green		
19	-06				50		50			Yellow		
20	-07				50		50			Medium		
21	-09				50		50			Cloudy		
22	-10				50		50			Shale		
23	-11				50		50			Black		
24	J122-02				50		50			Brown		
25					50		50			Orange		
					50		50			Colorless		

Comments: Samples for Methods 200.7 or 200.8 Analyses

If turbidity ≤ 1 NTU no digestion is required unless otherwise required by the project

Prepared By: mc Standard Added By: mc

Witnessed By: NT Extracts Recd. By: NT

Checked By: NT Date Disposed: 10-20-05

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 05J114

**METHOD 300.0
ANIONS**

Nine (9) water samples were received on 10/19/05 for Chloride, Nitrate-N, Nitrite-N, Orthophosphate-P and Sulfate analyses by method 300.0 in accordance with "Method for Determination of Inorganic Anions by Ion Chromatography", EPA 600/84-017.

1. Holding Time

Analyses met holding time criteria.

2. Method Blank

Method blanks were free of contamination at the reporting limit.

3. Lab Control Sample/Lab Control Sample Duplicate

Lab control results were within QC limits.

4. Duplicate

Duplicate sample was not designated in this SDG.

5. Matrix Spike

MS sample was not designated in this SDG.

6. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Nitrate-N and Nitrite-N were reported as Nitrogen concentration.
Orthophosphate-P was reported as Phosphorus concentration.

SAMPLE RESULTS

.....			
AL 8002	1000	1000	1000
.....			

8002

METHOD 300.0
CHLORIDE

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	AL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	NO	1	NA	1	.1	10/24/05 12:18	NA	AJ24-03	AJ24-01	ICJ030W	NA	NA
LCS1W	4.86	1	NA	1	.1	10/24/05 12:38	NA	AJ24-04	AJ24-01	ICJ030W	NA	NA
ICJ030W	4.74	1	NA	1	.1	10/24/05 12:59	NA	AJ24-05	AJ24-01	ICJ030W	NA	NA
J114-02	45.9	20	NA	20	2	10/24/05 13:39	NA	AJ24-07	AJ24-01	ICJ030W	10/17/05	10/19/05
J114-03	46.3	20	NA	20	2	10/24/05 13:59	NA	AJ24-08	AJ24-01	ICJ030W	10/17/05	10/19/05
J114-05	31.1	25	NA	25	2.5	10/24/05 14:39	NA	AJ24-10	AJ24-01	ICJ030W	10/18/05	10/19/05
J114-06	35.2	25	NA	25	2.5	10/24/05 14:59	NA	AJ24-11	AJ24-01	ICJ030W	10/18/05	10/19/05
J114-07	31.3	5	NA	5	.5	10/24/05 16:19	NA	AJ24-15	AJ24-13	ICJ030W	10/18/05	10/19/05
J114-09	19.3	5	NA	5	.5	10/24/05 16:39	NA	AJ24-16	AJ24-13	ICJ030W	10/18/05	10/19/05
J114-10	33.8	25	NA	25	2.5	10/24/05 16:59	NA	AJ24-17	AJ24-13	ICJ030W	10/18/05	10/19/05
J114-11	34.8	5	NA	5	.5	10/24/05 17:19	NA	AJ24-18	AJ24-13	ICJ030W	10/18/05	10/19/05
ICJ032WB	ND	1	NA	1	.1	10/25/05 11:33	NA	AJ25-03	AJ25-01	ICJ032W	NA	NA
ICJ032WL	4.8	1	NA	1	.1	10/25/05 11:53	NA	AJ25-04	AJ25-01	ICJ032W	NA	NA
ICJ032WC	4.72	1	NA	1	.1	10/25/05 12:13	NA	AJ25-05	AJ25-01	ICJ032W	NA	NA
J114-04	37.1	5	NA	5	.5	10/25/05 14:13	NA	AJ25-11	AJ25-01	ICJ032W	10/18/05	10/19/05

8003

MEINCO 300.0
NITRATE-N

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.1	.05	10/19/0513:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.1	.05	10/19/0513:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
MBLK1W	ICJ024W8	ND	1	NA	.1	.05	10/19/0514:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	1.96	1	NA	.1	.05	10/19/0516:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCD1W	ICJ024WC	1.98	1	NA	.1	.05	10/19/0516:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	.295	1	NA	.1	.05	10/19/0517:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.1	.05	10/19/0517:52	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	.671	1	NA	.1	.05	10/19/0517:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	.378	1	NA	.1	.05	10/19/0518:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	.23	1	NA	.1	.05	10/19/0519:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.1	.05	10/19/0519:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.1	.05	10/19/0520:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8004

METHOD 300.0
NITRITE-N

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.1	.05	10/19/05 13:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.1	.05	10/19/05 13:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
MBLKTW	ICJ024WB	ND	1	NA	.1	.05	10/19/05 14:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	1.91	1	NA	.1	.05	10/19/05 16:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCD1W	ICJ024WC	1.93	1	NA	.1	.05	10/19/05 16:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	ND	1	NA	.1	.05	10/19/05 17:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.1	.05	10/19/05 17:32	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	ND	1	NA	.1	.05	10/19/05 17:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	ND	1	NA	.1	.05	10/19/05 18:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	ND	1	NA	.1	.05	10/19/05 19:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.1	.05	10/19/05 19:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.1	.05	10/19/05 20:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8005

METHOD 300.0
ORTHOPHOSPHATE-P

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFD	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.5	.25	10/19/05 13:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.5	.25	10/19/05 13:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
MBLKTW	ICJ024WB	ND	1	NA	.5	.25	10/19/05 14:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	4.75	1	NA	.5	.25	10/19/05 16:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCD1W	ICJ024WC	5.01	1	NA	.5	.25	10/19/05 16:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	ND	1	NA	.5	.25	10/19/05 17:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.5	.25	10/19/05 17:32	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	ND	1	NA	.5	.25	10/19/05 17:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	ND	1	NA	.5	.25	10/19/05 18:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	ND	1	NA	.5	.25	10/19/05 19:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.5	.25	10/19/05 19:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.5	.25	10/19/05 20:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8006

METHOD 300.0
SULFATE

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ND	1	NA	.5	.25	10/19/0514:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCST1W	4.58	1	NA	.5	.25	10/19/0516:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCST1W	4.61	1	NA	.5	.25	10/19/0516:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-067	.485J	1	NA	.5	.25	10/19/0519:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
MBLK2W	ND	1	NA	.5	.25	10/24/0512:18	NA	AJ24-03	AJ24-01	ICJ030W	NA	NA
LCST2W	4.89	1	NA	.5	.25	10/24/0512:38	NA	AJ24-04	AJ24-01	ICJ030W	NA	NA
LCST2W	4.77	1	NA	.5	.25	10/24/0513:59	NA	AJ24-05	AJ24-01	ICJ030W	NA	NA
86-S14-068	234	20	NA	10	5	10/24/0513:59	NA	AJ24-07	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-069	236	20	NA	10	5	10/24/0514:19	NA	AJ24-08	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-072	555	40	NA	20	10	10/24/0514:59	NA	AJ24-09	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-071	342	25	NA	12.5	6.25	10/24/0514:59	NA	AJ24-10	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-065	289	25	NA	12.5	6.25	10/24/0514:59	NA	AJ24-11	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-073	443	40	NA	20	10	10/24/0515:19	NA	AJ24-12	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-066	309	25	NA	12.5	6.25	10/24/0516:59	NA	AJ24-17	AJ24-13	ICJ030W	10/18/05	10/19/05
86-S14-070	658	50	NA	25	12.5	10/24/0517:39	NA	AJ24-19	AJ24-13	ICJ030W	10/18/05	10/19/05

8007

Report date: 10/20/2005 4:06:07 PM
Printed by: Cherry Dam

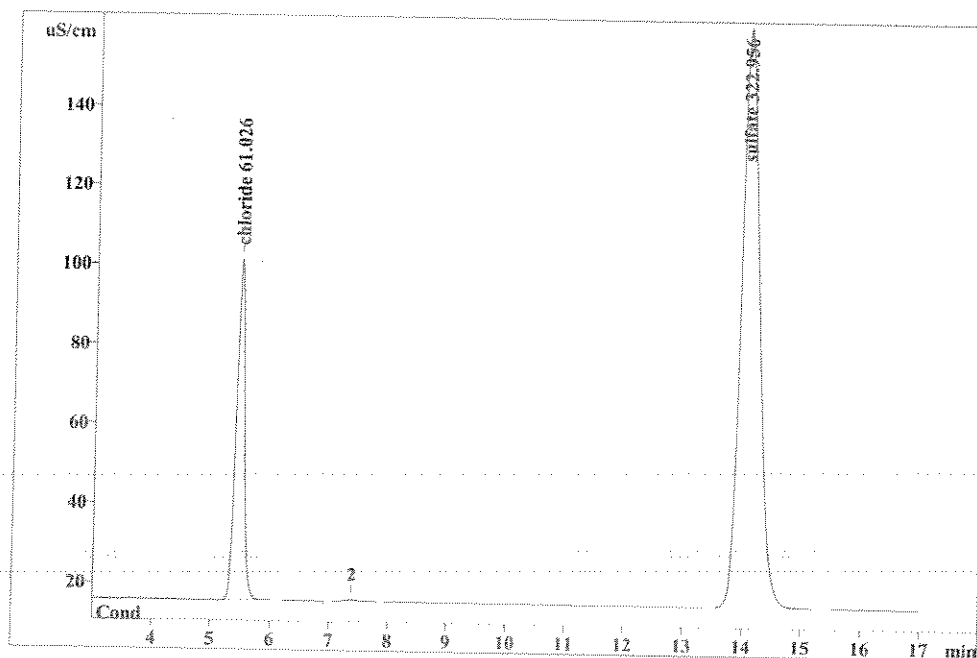
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Analysis from: 10/19/2005 1:54:53 PM
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Modified:
Method: IC100-119.mtw
Run operator: Cherry Dam
Analysis number: 7696

Last save: 10/19/2005 2:11:50 PM

Last save: 10/19/2005 2:05:53 P

SAMPLE:

Vial number: 12
Volume: 1.0 µL
Dilution: 1.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	5.46	85.40	827.889	61.026	chloride
2	7.37	0.45	10.785	0.000	
3	14.01	145.86	3134.830	322.956	sulfate
3	17.00	231.71	3973.504	383.982	

This report has been created by IC Net
METROHM LTD

Report date: 10/24/2005 7:34:41 PM
Printed by: Cherry Dam

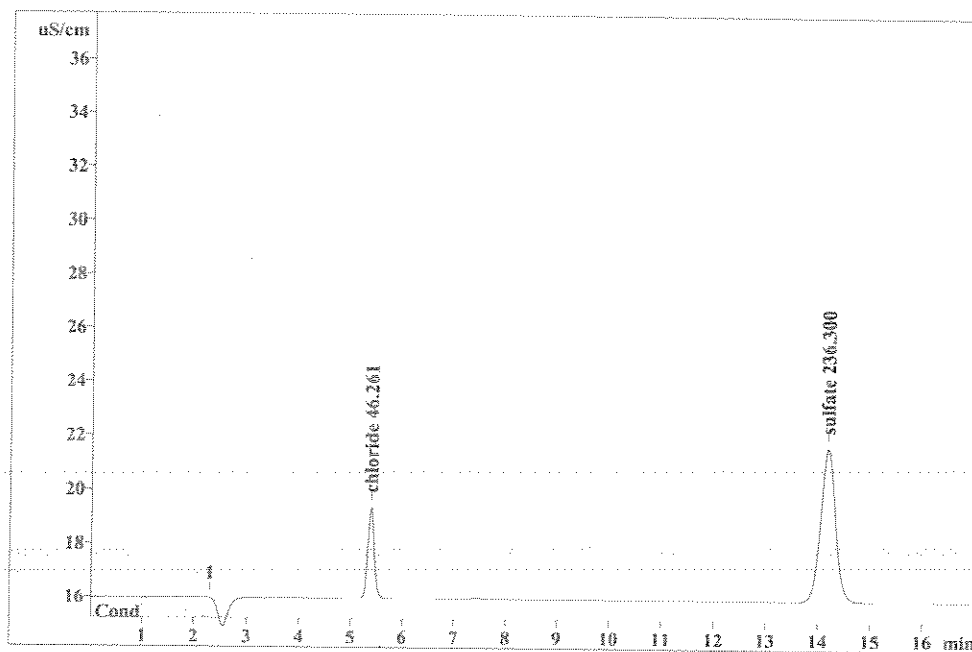
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Modified:
Method: IC100-I19.mtw
Run operator: Cherry Dam
Analysis number: 7853

Last save: 10/24/2005 2:16:08 PM

Last save: 10/24/2005 1:35:16 P

SAMPLE:

Vial number: 8
Volume: 1.0 µL
Dilution: 20.00
Amount: 1.0000



Quantitation method: Custom

No	Retention min	Height uS/cm	Area uS/cm*sec	Conc. mg/L	Name
1	2.30	0.75	36.181	0.000	
2	5.38	3.40	30.016	46.261	chloride ✓
3	14.18	5.71	113.596	236.300	sulfate ✓
3	17.00	9.86	179.792	282.561	

This report has been created by IC Net
METROHM LTD

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: October 17 through October 18, 2005
LDC Report Date: November 22, 2005
Matrix: Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05J114

Sample Identification

86-S14-063
86-S14-068
86-S14-069**
86-S14-072
86-S14-071
86-S14-065
86-S14-073
86-S14-064
86-S14-067
86-S14-066
86-S14-070

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 20.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 86-S14-068 and 86-S14-069** were identified as field duplicates. No total petroleum hydrocarbons as gasoline were detected in any of the samples.

X. Field Blanks

Samples 86-S14-063 and 86-S14-064 were identified as trip blanks. No total petroleum hydrocarbons as gasoline contaminants were found in these blanks.

Moffett Airfield, UST Site 14, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG
05J114

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification
Summary - SDG 05J114

No Sample Data Qualified in this SDG

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP



```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 16:15
Sample ID   : 86-S14-063                  Date Analyzed: 10/21/05 16:15
Lab Samp ID : J114-01                     Dilution Factor: 1
Lab File ID : EJ21006A                    Matrix       : WATER
Ext Btch ID : VA39J13                     % Moisture    : NA
Calib. Ref. : EJ21002A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	87	65-135	

RL : Reporting Limit

4004

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 16:51
Sample ID: 86-S14-068                    Date Analyzed: 10/21/05 16:51
Lab Samp ID: J114-02                     Dilution Factor: 1
Lab File ID: EJ21007A                    Matrix       : WATER
Ext Btch ID: VA39J13                     % Moisture    : NA
Calib. Ref.: EJ21002A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	84	65-135

RL : Reporting Limit

4006

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/21/05 17:27
Sample ID: 86-S14-069                    Date Analyzed: 10/21/05 17:27
Lab Samp ID: J114-03                      Dilution Factor: 1
Lab File ID: EJ21008A                     Matrix          : WATER
Ext Btch ID: VA39J13                      % Moisture      : NA
Calib. Ref.: EJ21002A                     Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	87	65-135	

RL : Reporting Limit

4008

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 18:03
Sample ID   : 86-S14-072                  Date Analyzed: 10/21/05 18:03
Lab Samp ID : J114-04                      Dilution Factor: 1
Lab File ID : EJ21009A                     Matrix          : WATER
Ext Btch ID : VA39J13                      % Moisture      : NA
Calib. Ref. : EJ21002A                     Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.021J	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	92	65-135	

RL : Reporting Limit

4010

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 18:39
Sample ID: 86-S14-071                    Date Analyzed: 10/21/05 18:39
Lab Samp-ID: J114-05                      Dilution Factor: 1
Lab File ID: EJ21010A                    Matrix       : WATER
Ext Btch ID: VA39J13                     % Moisture    : NA
Calib. Ref.: EJ21002A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.55	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	101	65-135

RL : Reporting Limit

4012

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/21/05 19:15
Sample ID   : 86-S14-065             Date Analyzed: 10/21/05 19:15
Lab Samp ID : J114-06                Dilution Factor: 1
Lab File ID : EJ21011A               Matrix       : WATER
Ext Btch ID : VA39J13                % Moisture    : NA
Calib. Ref. : EJ21002A               Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	82	65-135

RL : Reporting Limit

4014

Signature

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 19:51
Sample ID   : 86-S14-073                 Date Analyzed: 10/21/05 19:51
Lab Samp ID : J114-07                    Dilution Factor: 1
Lab File ID : EJ21012A                  Matrix      : WATER
Ext Btch ID : VA39J13                   % Moisture   : NA
Calib. Ref. : EJ21002A                  Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	87	65-135

RL : Reporting Limit

4016

Signature
11/22/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 21:39
Sample ID   : 86-S14-064                  Date Analyzed: 10/21/05 21:39
Lab Samp ID : J114-08                     Dilution Factor: 1
Lab File ID : EJ21015A                   Matrix       : WATER
Ext Btch ID : VA39J13                     % Moisture    : NA
Calib. Ref. : EJ21013A                   Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	97	65-135	

RL : Reporting Limit

4018

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 22:15
Sample ID   : 86-S14-067                  Date Analyzed: 10/21/05 22:15
Lab Samp ID : J114-09T                    Dilution Factor: 10
Lab File ID : EJ21016A                    Matrix       : WATER
Ext Btch ID : VA39J13                     % Moisture    : NA
Calib. Ref. : EJ21013A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	3.9	1	.2
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	115	65-135	

RL : Reporting Limit

4020

11/20/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/21/05 22:51
Sample ID   : 86-S14-066                  Date Analyzed: 10/21/05 22:51
Lab Samp ID : J114-10                      Dilution Factor: 1
Lab File ID : EJ21017A                    Matrix       : WATER
Ext Btch ID : VA39J13                     % Moisture    : NA
Calib. Ref. : EJ21013A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.24	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	128	65-135

RL : Reporting Limit

4022

11/29/05

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTD 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/21/05 23:27
Sample ID: 86-S14-070                    Date Analyzed: 10/21/05 23:27
Lab Samp ID: J114-11                     Dilution Factor: 1
Lab File ID: EJ21018A                    Matrix          : WATER
Ext Btch ID: VA39J13                     % Moisture      : NA
Calib. Ref.: EJ21013A                    Instrument ID   : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	96	65-135	

RL : Reporting Limit

4024

Handwritten signature

LDC #: 14301A7

SDG #: 05J114

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/22/05

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC TPH as Gasoline (EPA SW846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/17-18/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	700 & 12V
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	Client specified
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D=2+3
X.	Field blanks	ND	TB=1, 8

Note: A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-063	W	11	86-S14-070	W	21	MBK1W	31	
2	86-S14-068		12			22		32	
3	86-S14-069**		13			23		33	
4	86-S14-072		14			24		34	
5	86-S14-071		15			25		35	
6	86-S14-065		16			26		36	
7	86-S14-073		17			27		37	
8	86-S14-064		18			28		38	
9	86-S14-067		19			29		39	
10	86-S14-066		20			30		40	

Notes:

LDC #: 14301-A7
SDG #: 05114

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: g
2nd Reviewer: g

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u>1</u> %D or %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15% or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 4301AT
SDG #: 05114

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field duplicates?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Were field blanks identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 14301AT
SDG #: 051114

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: R

METHOD: GC ☒ HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = $100 \cdot (S/X)$
A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported		Recalculated		Reported		Recalculated	
				CF (100 std)	CF (100 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD	Average CF (initial)	%RSD
1	1CA	10/14/05	GR0	13369	13369	14372.0	14372.0	6.9	6.9		
2											
3											
4											

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14301A7
SDG #: 051114

METHOD: ☒ GC ☐ HPLC

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 2

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 3

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
BFB	DB-5	40	34.76	87	87	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 4361AT
SDG #: 05114

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: ☒ GC ☐ HPLC

Page: 1 of 1
Reviewer: g
2nd Reviewer: g

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

$$\% \text{Recovery} = 100 * (SSC - SC) / SA$$

Where SSC = Spiked sample concentration
SA = Spike added
SC = Sample concentration

$$RPD = ((SSCLCS - SSCCLCSD) * 2) / (SSCLCS + SSCCLCSD) * 100$$

LCS/LCSD samples: LC51101 LCSD = Laboratory Control Sample duplicate

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS		Percent Recovery		LCSD		Percent Recovery		RPD	
	LCS	LCSD		LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	0.5	0.5	-	0.407	0.453	81	81	91	91	11	11				
Diesel (8015)															
Benzene (8021B)															
Methane (RSK-175)															
2,4-D (8151)															
Dinoseb (8151)															
Naphthalene (8310)															
Anthracene (8310)															
HMX (8330)															
2,4,6-Trinitrotoluene (8330)															

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

METHOD: ☒ GC ☐ HPLC

Y	N	N/A
Y	N	N/A

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds agree within 10% of the reported results?

$$\text{Concentration} = \frac{(A)(F_v)(Df)}{(RF)(V_s \text{ or } W_s)(\%S/100)}$$

Example:

Sample ID. AD Compound Name _____

Concentration =

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound
in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

[illegible]

Comments:

LDC #: 4301AT
SDG #: 05114

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: AK
2nd Reviewer: R

METHOD: GC ☒ HPLC ☐

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
CF = A/C CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	2121002A	10/21/05	PER	500	433.29	13	433.29	13
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: October 17 through October 18, 2005
LDC Report Date: November 28, 2005
Matrix: Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05J114

Sample Identification

86-S14-068
86-S14-069
86-S14-072
86-S14-071
86-S14-065
86-S14-073
86-S14-067
86-S14-066
86-S14-070
86-S14-068DUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Chloride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, and EPA Method 310.1 for Alkalinity.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical or advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 86-S14-068 and 86-S14-069 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	86-S14-068	86-S14-069	
Chloride	45.9	46.3	1
Sulfate	234	236	1
Bicarbonate alkalinity	304	289	5
Total alkalinity	304	289	5

X. Field Blanks

No field blanks were identified in this SDG.

Moffett Airfield, UST Site 14, CTO 86
Wet Chemistry - Data Qualification Summary - SDG 05J114

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, CTO 86
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 05J114

No Sample Data Qualified in this SDG

METHOD 310.1
TOTAL ALKALINITY AS CaCO3

Client : TETRA TECH EC, INC
Project : US1 SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 153

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ALJ018MB	ND	1	NA	5	1	10/25/0513:00	NA	ALJ018W-01	NA	ALJ018W	NA	NA
LCS1W	ALJ018ML	47.7	1	NA	5	1	10/25/0513:05	NA	ALJ018W-02	NA	ALJ018W	NA	NA
LCD1W	ALJ018MC	47.7	1	NA	5	1	10/25/0513:10	NA	ALJ018W-03	NA	ALJ018W	NA	NA
86-S14-068	J114-02	304	1	NA	5	1	10/25/0513:15	NA	ALJ018W-04	NA	ALJ018W	10/17/05	10/19/05
86-S14-068DUP	J114-02D	301	1	NA	5	1	10/25/0513:20	NA	ALJ018W-05	NA	ALJ018W	10/17/05	10/19/05
86-S14-069	J114-03	289	1	NA	5	1	10/25/0513:25	NA	ALJ018W-06	NA	ALJ018W	10/17/05	10/19/05
86-S14-072	J114-04	404	1	NA	5	1	10/25/0513:30	NA	ALJ018W-07	NA	ALJ018W	10/18/05	10/19/05
86-S14-071	J114-05	557	1	NA	5	1	10/25/0513:35	NA	ALJ018W-08	NA	ALJ018W	10/18/05	10/19/05
86-S14-065	J114-06	539	1	NA	5	1	10/25/0513:40	NA	ALJ018W-09	NA	ALJ018W	10/18/05	10/19/05
86-S14-073	J114-07	447	1	NA	5	1	10/25/0513:45	NA	ALJ018W-10	NA	ALJ018W	10/18/05	10/19/05
86-S14-067	J114-09R	728	1	NA	5	1	10/25/0513:55	NA	ALJ018W-12	NA	ALJ018W	10/18/05	10/19/05
86-S14-066	J114-10	504	1	NA	5	1	10/25/0514:00	NA	ALJ018W-13	NA	ALJ018W	10/18/05	10/19/05
86-S14-070	J114-11	409	1	NA	5	1	10/25/0514:05	NA	ALJ018W-14	NA	ALJ018W	10/18/05	10/19/05

8080

11/29/05

METHOD 300.0
CHLORIDE

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICJ030WB	ND	1	NA	1	1	10/24/0512:18	NA	AJ24-03	AJ24-01	ICJ030W	NA	NA
LCS1W	ICJ030WL	4.86	1	NA	1	1	10/24/0512:38	NA	AJ24-04	AJ24-01	ICJ030W	NA	NA
LCD1W	ICJ030WC	4.74	1	NA	1	1	10/24/0512:59	NA	AJ24-05	AJ24-01	ICJ030W	NA	NA
86-S14-068	J114-02	45.9	20	NA	20	2	10/24/0513:39	NA	AJ24-07	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-069	J114-03	46.3	20	NA	20	2	10/24/0513:59	NA	AJ24-08	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-071	J114-05	31.1	25	NA	25	2.5	10/24/0514:39	NA	AJ24-10	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-065	J114-06	35.2	25	NA	25	2.5	10/24/0514:59	NA	AJ24-11	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-073	J114-07	31.3	5	NA	5	5	10/24/0516:19	NA	AJ24-15	AJ24-13	ICJ030W	10/18/05	10/19/05
86-S14-067	J114-09	19.3	5	NA	5	5	10/24/0516:39	NA	AJ24-16	AJ24-13	ICJ030W	10/18/05	10/19/05
86-S14-066	J114-10	33.8	25	NA	25	2.5	10/24/0516:59	NA	AJ24-17	AJ24-13	ICJ030W	10/18/05	10/19/05
86-S14-070	J114-11	34.8	5	NA	5	5	10/24/0517:19	NA	AJ24-18	AJ24-13	ICJ030W	10/18/05	10/19/05
MBLK2W	ICJ032WB	ND	1	NA	1	1	10/25/0511:33	NA	AJ25-03	AJ25-01	ICJ032W	NA	NA
LCS2W	ICJ032WL	4.8	1	NA	1	1	10/25/0511:53	NA	AJ25-04	AJ25-01	ICJ032W	NA	NA
LCD2W	ICJ032WC	4.72	1	NA	1	1	10/25/0512:13	NA	AJ25-05	AJ25-01	ICJ032W	NA	NA
86-S14-072	J114-04	37.1	5	NA	5	5	10/25/0514:13	NA	AJ25-11	AJ25-01	ICJ032W	10/18/05	10/19/05

8003

10/29/05

METHOD 300.0
NITRATE-N

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	NDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFD	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.1	.05	10/19/0513:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.1	.05	10/19/0513:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
MBLK1W	ICJ024WB	ND	1	NA	.1	.05	10/19/0514:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	1.96	1	NA	.1	.05	10/19/0516:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
	ICJ024WC	1.98	1	NA	.1	.05	10/19/0516:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	.295	1	NA	.1	.05	10/19/0517:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.1	.05	10/19/0517:32	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	.671	1	NA	.1	.05	10/19/0517:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	.378	1	NA	.1	.05	10/19/0518:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	.23	1	NA	.1	.05	10/19/0519:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.1	.05	10/19/0519:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.1	.05	10/19/0520:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8004

Handwritten signature

METHOD 300.0
NITRITE-N

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST (mg/L)	RL (mg/L)	MOL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.1	.05	10/19/0513:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.1	.05	10/19/0513:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
MBLK1W	ICJ024W	ND	1	NA	.1	.05	10/19/0514:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024W	1.91	1	NA	.1	.05	10/19/0516:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024W	1.93	1	NA	.1	.05	10/19/0516:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	ND	1	NA	.1	.05	10/19/0517:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.1	.05	10/19/0517:32	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	ND	1	NA	.1	.05	10/19/0517:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	ND	1	NA	.1	.05	10/19/0518:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	ND	1	NA	.1	.05	10/19/0519:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.1	.05	10/19/0519:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.1	.05	10/19/0520:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8005

11/29/05

METHOD 300.0
ORTHOPHOSPHATE-P

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
86-S14-068	J114-02	ND	1	NA	.5	.25	10/19/0513:36	NA	AJ19-11	AJ19-01	ICJ024W	10/17/05	10/19/05
86-S14-069	J114-03	ND	1	NA	.5	.25	10/19/0513:54	NA	AJ19-12	AJ19-01	ICJ024W	10/17/05	10/19/05
M8LK1W	ICJ024WB	ND	1	NA	.5	.25	10/19/0514:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	4.75	1	NA	.5	.25	10/19/0516:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WC	5.01	1	NA	.5	.25	10/19/0516:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-072	J114-04	ND	1	NA	.5	.25	10/19/0517:12	NA	AJ19-18	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-071	J114-05	ND	1	NA	.5	.25	10/19/0517:32	NA	AJ19-19	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-065	J114-06	ND	1	NA	.5	.25	10/19/0517:52	NA	AJ19-20	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-073	J114-07	ND	1	NA	.5	.25	10/19/0518:43	NA	AJ19-21	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-067	J114-09	ND	1	NA	.5	.25	10/19/0519:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-066	J114-10	ND	1	NA	.5	.25	10/19/0519:24	NA	AJ19-23	AJ19-13	ICJ024W	10/18/05	10/19/05
86-S14-070	J114-11	ND	1	NA	.5	.25	10/19/0520:44	NA	AJ19-27	AJ19-25	ICJ024W	10/18/05	10/19/05

8006

11/29/05

METHOD 300.0
SULFATE

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
Batch No. : 05J114

Matrix : WATER
Instrument ID : 100

SAMPLE ID	EMAX SAMPLE ID	RESULTS (mg/L)	DLF	MOIST	RL (mg/L)	MDL (mg/L)	Analysis DATE/TIME	Extraction DATE/TIME	LFID	CAL REF	PREP BATCH	Collection DATE/TIME	Received DATE/TIME
MBLK1W	ICJ024WB	ND	1	NA	.5	.25	10/19/05 14:55	NA	AJ19-15	AJ19-13	ICJ024W	NA	NA
LCS1W	ICJ024WL	4.58	1	NA	.5	.25	10/19/05 16:32	NA	AJ19-16	AJ19-13	ICJ024W	NA	NA
LCD1W	ICJ024WC	4.61	1	NA	.5	.25	10/19/05 16:52	NA	AJ19-17	AJ19-13	ICJ024W	NA	NA
86-S14-067	J114-09	.485J	1	NA	.5	.25	10/19/05 19:03	NA	AJ19-22	AJ19-13	ICJ024W	10/18/05	10/19/05
MBLK2W	ICJ030WB	ND	1	NA	.5	.25	10/24/05 12:18	NA	AJ24-03	AJ24-01	ICJ030W	NA	NA
LCS2W	ICJ030WL	4.89	1	NA	.5	.25	10/24/05 12:38	NA	AJ24-04	AJ24-01	ICJ030W	NA	NA
LCD2W	ICJ030WC	4.77	1	NA	.5	.25	10/24/05 12:59	NA	AJ24-05	AJ24-01	ICJ030W	NA	NA
86-S14-068	J114-02	234	20	NA	10	.5	10/24/05 13:39	NA	AJ24-07	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-069	J114-03	236	20	NA	10	.5	10/24/05 13:59	NA	AJ24-08	AJ24-01	ICJ030W	10/17/05	10/19/05
86-S14-072	J114-04	555	40	NA	20	10	10/24/05 14:19	NA	AJ24-09	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-071	J114-05	342	25	NA	12.5	6.25	10/24/05 14:39	NA	AJ24-10	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-065	J114-06	289	25	NA	12.5	6.25	10/24/05 14:59	NA	AJ24-11	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-073	J114-07	443	40	NA	20	10	10/24/05 15:19	NA	AJ24-12	AJ24-01	ICJ030W	10/18/05	10/19/05
86-S14-066	J114-10	309	25	NA	12.5	6.25	10/24/05 16:59	NA	AJ24-17	AJ24-13	ICJ030W	10/18/05	10/19/05
86-S14-070	J114-11	658	50	NA	25	12.5	10/24/05 17:39	NA	AJ24-19	AJ24-13	ICJ030W	10/18/05	10/19/05

8007

9/11/29/05

LDC #: 14301A6

VALIDATION COMPLETENESS WORKSHEET

Date: 11-22-05

SDG #: 05J114

Level III

Page: 1 of 1

Laboratory: EMAX Laboratories, Inc.

Reviewer: MG

2nd Reviewer: J

METHOD: (Analyte) Alkalinity (EPA Method 310.1), Chloride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-17-05 through 10-18-05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	N	Client specified
V.	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 1 + 2
X.	Field blanks	N	

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

all water

1	86-S14-068	11	PBW1	21		31	
2	86-S14-069	12	PBW2	22		32	
3	86-S14-072	13		23		33	
4	86-S14-071	14		24		34	
5	86-S14-065	15		25		35	
6	86-S14-073	16		26		36	
7	86-S14-067	17		27		37	
8	86-S14-066	18		28		38	
9	86-S14-070	19		29		39	
10	86-S14-068DUP	20		30		40	

Notes: _____

SDG #: 05 J114

Sample Specific Analysis Reference

2nd reviewer: h

All circled methods are applicable to each sample.

[illegible]

Comments: _____

LDC #: 14301A6

SDG #: 05J114

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: MG

2nd reviewer: J

METHOD: Inorganics, Method see cover
☒ N N/A
☒ N N/A

Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (<u>mg/L</u>)		RPD (Limit)	Difference (Limit)	Qualifier
	1	2			
Cl	45.9	46.3	1		
SO ₄	234	236	1		
Bicarb Alk	304	289	5		
Tot. Alk	304	289	5		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Moffett Air Field, UST Site 14, CTO 86
Collection Date: October 17 through October 18, 2005
LDC Report Date: November 22, 2005
Matrix: Water
Parameters: Metals
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 05J114

Sample Identification

86-S14-068

86-S14-069**

86-S14-072

86-S14-071

86-S14-065

86-S14-073

86-S14-067

86-S14-066

86-S14-070

86-S14-068MS

86-S14-068MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6010B for Metals. The metals analyzed were Calcium, Iron, Magnesium, Potassium, and Sodium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Sodium	0.535 mg/L	All samples in SDG 05J114
ICB/CCB	Potassium	1.118 mg/L	All samples in SDG 05J114

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
86-S14-069**	Potassium	3.54 mg/L	3.54U mg/L
86-S14-072	Potassium	2.08 mg/L	2.08U mg/L
86-S14-071	Potassium	2.65 mg/L	2.65U mg/L
86-S14-065	Potassium	1.99 mg/L	1.99U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
86-S14-073	Potassium	1.89 mg/L	1.89U mg/L
86-S14-067	Potassium	1.48 mg/L	1.48U mg/L
86-S14-066	Potassium	2.3 mg/L	2.3U mg/L
86-S14-070	Potassium	3.38 mg/L	3.38U mg/L

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
86-S14-068MS/MSD (All samples in SDG 05J114)	Calcium	77 (80-120)	-	-	J (all detects) UJ (all non-detects)	A

VI. Duplicate Sample Analysis

Duplicate sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples 86-S14-068 and 86-S14-069** were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	86-S14-068	86-S14-069**	
Calcium	157	153	2.5
Iron	1.07	0.977	9.0
Magnesium	47.4	43.8	7.9
Potassium	1.0U	3.54	Not calculable
Sodium	35.3	33.4	5.5

XIV. Field Blanks

No field blanks were identified in this SDG.

Moffett Air Field, UST Site 14, CTO 86
Metals - Data Qualification Summary - SDG 05J114

SDG	Sample	Analyte	Flag	A or P	Reason
05J114	86-S14-068 86-S14-069** 86-S14-072 86-S14-071 86-S14-065 86-S14-073 86-S14-067 86-S14-066 86-S14-070	Calcium	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

Moffett Air Field, UST Site 14, CTO 86
Metals - Laboratory Blank Data Qualification Summary - SDG 05J114

SDG	Sample	Analyte	Modified Final Concentration	A or P
05J114	86-S14-069**	Potassium	3.54U mg/L	A
05J114	86-S14-072	Potassium	2.08U mg/L	A
05J114	86-S14-071	Potassium	2.65U mg/L	A
05J114	86-S14-065	Potassium	1.99U mg/L	A
05J114	86-S14-073	Potassium	1.89U mg/L	A
05J114	86-S14-067	Potassium	1.48U mg/L	A
05J114	86-S14-066	Potassium	2.3U mg/L	A
05J114	86-S14-070	Potassium	3.38U mg/L	A

METHOD 3010A/6010B
METALS BY ICP

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Client      : TETRA TECH EC, INC      Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.     : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-068                 Date Analyzed: 10/21/05 13:09
Lab Samp ID: J114-02                   Dilution Factor: 1
Lab File ID: I07J033018                Matrix      : WATER
Ext Btch ID: IPJ029W                   % Moisture   : NA
Calib. Ref.: I07J033010                Instrument ID: EMAX1107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	157 J	5	.1
Iron	1.07	.1	.04
Magnesium	47.4	5	.1
Potassium	ND	5	.1
Sodium	35.3	5	.25

7003

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.    : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-069               Date Analyzed: 10/21/05 13:17
Lab Samp ID: J114-03                 Dilution Factor: 1
Lab File ID: 107J033020             Matrix       : WATER
Ext Btch ID: IPJ029W                 % Moisture   : NA
Calib. Ref.: 107J033010             Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	153 J	5	.1
Iron	.977	.1	.04
Magnesium	43.8	5	.1
Potassium	3.54J u	5	1
Sodium	33.4	5	.25

7004

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.     : 05J114                       Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-072                      Date Analyzed: 10/21/05 13:22
Lab Samp ID: J114-04                       Dilution Factor: 1
Lab File ID: 107J033021                    Matrix       : WATER
Ext Btch ID: IPJ029W                       % Moisture   : NA
Calib. Ref.: 107J033010                    Instrument ID: EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	236 J	5	.1
Iron	.657	.1	.04
Magnesium	87	5	.1
Potassium	2.08J W	5	.1
Sodium	30.9	5	.25

7005

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```
=====
Client       : TETRA TECH EC, INC      Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.      : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID    : 86-S14-071             Date Analyzed: 10/21/05 13:37
Lab Samp ID  : J114-05                 Dilution Factor: 1
Lab File ID  : 107J033024             Matrix       : WATER
Ext Btch ID  : IPJ029W                % Moisture   : NA
Calib. Ref.  : 107J033022             Instrument ID : EMAX1107
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	218 J	5	.1
Iron	ND	.1	.04
Magnesium	88.7	5	.1
Potassium	2.65J W	5	.1
Sodium	35.9	5	.25

7006

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.      : 05J114                      Date Extracted: 10/20/05 14:30
Sample ID:   : 86-S14-065                  Date Analyzed: 10/21/05 13:41
Lab Samp ID: : J114-06                     Dilution Factor: 1
Lab File ID: : 107J033025                  Matrix       : WATER
Ext Btch ID: : 1P029W                     % Moisture   : NA
Calib. Ref.: : 107J033022                  Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	221 J	5	.1
Iron	1.3	.1	.04
Magnesium	67.1	5	.1
Potassium	1.99J W	5	1
Sodium	36.3	5	.25

7007

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.      : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID: 86-S14-073                 Date Analyzed: 10/21/05 13:45
Lab Samp ID: J114-07                  Dilution Factor: 1
Lab File ID: 107J033026               Matrix       : WATER
Ext Btch ID: IPJ029W                  % Moisture   : NA
Calib. Ref.: 107J033022               Instrument ID: EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	222 J	5	.1
Iron	2.57	.1	.04
Magnesium	89.7	5	.1
Potassium	1.89J W	5	1
Sodium	34.2	5	.25

7008

10/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.      : 05J114                      Date Extracted: 10/20/05 14:30
Sample ID:   : 86-S14-067                  Date Analyzed: 10/21/05 13:49
Lab Samp ID: : J114-09                     Dilution Factor: 1
Lab File ID: : 107J033027                  Matrix       : WATER
Ext Btch ID: : IPJ029W                     % Moisture    : NA
Calib. Ref.: : 107J033022                  Instrument ID : EMAX1107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	198 J	5	.1
Iron	3.93	.1	.04
Magnesium	56.2	5	.1
Potassium	1.48J u	5	1
Sodium	47.5	5	.25

7009

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
SDG NO.    : 05J114                 Date Extracted: 10/20/05 14:30
Sample ID   : 86-S14-066             Date Analyzed: 10/21/05 13:55
Lab Samp ID : J114-10                 Dilution Factor: 1
Lab File ID : I07J033028             Matrix       : WATER
Ext Btch ID : IPJ029W                % Moisture    : NA
Calib. Ref.: I07J033022             Instrument ID : EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	202 J	5	.1
Iron	1.94	.1	.04
Magnesium	72.7	5	.1
Potassium	2.3J u	5	1
Sodium	32.1	5	.25

7010

11/29/05

METHOD 3010A/6010B
METALS BY ICP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
SDG NO.      : 05J114                      Date Extracted: 10/20/05 14:30
Sample ID:   86-S14-070                    Date Analyzed: 10/21/05 13:59
Lab Samp ID: J114-11                       Dilution Factor: 1
Lab File ID: 107J033029                    Matrix       : WATER
Ext Btch ID: IPJ029W                       % Moisture   : NA
Calib. Ref.: 107J033022                    Instrument ID: EMAXT107
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Calcium	261 J	5	.1
Iron	ND	.1	.04
Magnesium	105	5	.1
Potassium	3.38J u	5	1
Sodium	28.4	5	.25

7011

8

11/29/05

LDC #: 14301A4

VALIDATION COMPLETENESS WORKSHEET

SDG #: 05J114

Level III/IV

Laboratory: EMAX Laboratories, Inc.

Date: 11/21/05

Page: 1 of 1

Reviewer: DG

2nd Reviewer: MG

METHOD: Metals (EPA SW 846 Method 6010B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/17 - 10/18/05
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	7 ms/mo
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSP
VIII.	Internal Standard (ICP-MS)	N	not utilized
IX.	Furnace Atomic Absorption QC	N	
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 1, 2
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-068	11	86-S14-068MSD	21		31	
2	86-S14-069**	12	FB	22		32	
3	86-S14-072	13		23		33	
4	86-S14-071	14		24		34	
5	86-S14-065	15		25		35	
6	86-S14-073	16		26		36	
7	86-S14-067	17		27		37	
8	86-S14-066	18		28		38	
9	86-S14-070	19		29		39	
10	86-S14-068MS	20		30		40	

Notes:

LDC #: 14301A4
SDG #: 050114

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: MG

Method: Metals (EPA SW 826 Method 6010/7000/6020)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	<input checked="" type="checkbox"/>			
Were the proper number of standards used?	<input checked="" type="checkbox"/>			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	<input checked="" type="checkbox"/>			
Were all initial calibration correlation coefficients ≥ 0.995 ?	<input checked="" type="checkbox"/>			
Was a midrange cyanide standard distilled?			<input checked="" type="checkbox"/>	
III. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>			
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	<input checked="" type="checkbox"/>			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	<input checked="" type="checkbox"/>			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	<input checked="" type="checkbox"/>			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 ⁸⁰⁻¹²⁰ QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		<input checked="" type="checkbox"/>		
Were the MS/MSD or duplicate relative percent differences (RPD) $\leq 20\%$ for waters and $\leq 35\%$ for soil samples? A control limit of ± 1 RL (± 2 RL for soil) was used for samples that were ≤ 5 X the RL, including when only one of the duplicate sample values were ≤ 5 X the RL.	<input checked="" type="checkbox"/>			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>			
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	<input checked="" type="checkbox"/>			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995 ?			<input checked="" type="checkbox"/>	
Do all applicable analyses have duplicate injections?			<input checked="" type="checkbox"/>	

LDC #: 14301A4
SDG #: 05J114

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: LS
2nd Reviewer: MS

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) ≤ 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA SW 846 Method 8020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

Page: 1 of 1
Reviewer: EG
2nd reviewer: MG

[illegible]

ELEMENTS.4

LDC #: 14301A4
SDG #: 65J119

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 8010/7000) Soil preparation factor applied: 0.5
Sample Concentration units, unless otherwise noted: mg/L Associated Samples: All

Page: 1 of 1		Reviewer: D	2nd Reviewer: MG						
Associated Samples: 29191C		all							
Sample Identification									
2	3	4	5	6	7	8	9		
Al									
Sb									
As									
Ba									
Be									
Cd									
Ca									
Cr									
Co									
Cu									
Fe									
Pb									
Mg									
Mn									
Hg									
Ni									
K									
Se									
Ag									
Na									
Ti									
V									
Zn									
B									
Mo									
Sr									
Blank Action Limit	mg/L								
Maximum ICB/CCB* (ug/L)	mg/L								
Maximum PB* (mg/Kg)	mg/L								
Maximum PB* (ug/L)	mg/L								
1.118	5.590	3.54	2.08	2.65	1.99	1.89	1.48	2.3	3.38
0.535	2.675								
Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These samples were qualified as not detected, "U".									
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.									
BLNKSMP-452									

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: bu
2nd Reviewer: MG

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a matrix spike analyzed for each matrix in this SDG?	Y	N	N/A
Were matrix spike percent recoveries (%R) within the control limits of Z5-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	Y	N	N/A

Were all duplicate sample relative differences (RPD) $\leq 20\%$ for water samples and $\leq 35\%$ for soil samples?

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

[illegible]

Comments:

LDC #: 14301A4
SDG #: 05J114

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: en
2nd reviewer: MG

METHOD: Inorganics, Method 6010B

☒ N N/A
☒ N N/A

Were field duplicate pairs identified in this SDG?
Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L)		RPD (Limits)	Qualifier
	1	2		
Ca	157	153	2.5	
Fe	1.07	0.977	9.0	
Mg	47.4	43.8	7.9	
K	1.02	3.54	NC	
Na	35.3	33.4	5.5	

Analyte	Concentration ()		RPD (Limits)	Qualifier

Analyte	Concentration ()		RPD (Limits)	Qualifier

Analyte	Concentration ()		RPD (Limits)	Qualifier

LDC #: 14301A-4
SDG #: 052114

VALIDATION FINDINGS WORKSHEET Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: HP
2nd Reviewer: MG

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found} - \text{True}}{\text{True}} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated		Acceptable (Y/N)
					%R / RPD / %D	Reported %R / RPD / %D	
ICSPAB	ICP interference check	Mg	mg/L	500 mg/L		97	Y
LCS	Laboratory control sample	Fe	10.1 mg/L	10 mg/L	101	101	Y
10	Matrix spike	Na (SSR-SR) (82.353)		50 mg/L	93	93	Y
10/11 no/mv	Duplicate	K	51.7	52.8	2 (240)	2 (240)	Y
1	ICP serial dilution	Ca	159	157 mg	1 (20)	1 (20)	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14301A4
SDG #: 05J114

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 6 of 1
Reviewer: MG
2nd Reviewer: MG

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = $\frac{\text{Found} \times 100}{\text{True}}$ Where: Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated		Reported		Acceptable (Y/N)
					%R	%R	%R	%R	
ICV	ICP (Initial calibration)	Cd	49.67	50.50 <small>or</small>	99		99		Y
	GFAA (Initial calibration)								
	CVAA (Initial calibration)								
CCV	ICP (Continuing calibration)	Fe	5.046	5	101		101		Y
	GFAA (Continuing calibration)								
	CVAA (Continuing calibration)								
	Cyanide (Initial calibration)								
	Cyanide (Continuing calibration)								

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

SDG #:

Sample Calculation Verification

2nd reviewer: MG

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Y	N	N/A	Are all detection limits below the CRDL?

Detected analyte results for 2 were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(RD)(FV)(DII)}{(In. Vol.)(\%S)}$$

Recalculation:

RD	=	Raw data concentration
FV	=	Final volume (ml)
ln. Vol.	=	Initial volume (ml) or weight (G)
Dil	=	Dilution factor
%S	=	Decimal percent solids

$$Na = \frac{(33.38)(50)}{50} = 33.38 \text{ mg/L}$$

[illegible]

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: Moffett Air Field, UST Site 14, CTO 86
Collection Date: October 17 through October 18, 2005
LDC Report Date: November 22, 2005
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 05J114

Sample Identification

86-S14-063
86-S14-068
86-S14-069**
86-S14-072
86-S14-071
86-S14-065
86-S14-073
86-S14-064
86-S14-067
86-S14-067DL
86-S14-066
86-S14-066DL
86-S14-070

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
86-S14-067 86-S14-066	Benzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 86-S14-068 and 86-S14-069** were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Samples 86-S14-063 and 86-S14-064 were identified as trip blanks. No volatile contaminants were found in these blanks.

Moffett Air Field, UST Site 14, CTO 86
Volatiles - Data Qualification Summary - SDG 05J114

SDG	Sample	Compound	Flag	A or P	Reason
05J114	86-S14-067 86-S14-066	Benzene	J (all detects)	A	Compound quantitation and CRQLs

Moffett Air Field, UST Site 14, CTO 86
Volatiles - Laboratory Blank Data Qualification Summary - SDG 05J114

No Sample Data Qualified in this SDG

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 20:33
Sample ID   : 86-S14-063             Date Analyzed: 10/22/05 20:33
Lab Samp ID : J114-01                 Dilution Factor: 1
Lab File ID : RJQ719                 Matrix       : WATER
Ext Btch ID : V005J58                 % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

2004

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 23:38
Sample ID   : B6-S14-068             Date Analyzed: 10/22/05 23:38
Lab Samp ID : J114-02                 Dilution Factor: 1
Lab File ID : RJQ724                 Matrix          : WATER
Ext Btch ID : V005J58                % Moisture       : NA
Calib. Ref. : RIQ499                 Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-DB	101	75-125

RL: Reporting Limit

2005

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/17/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/23/05 00:15
Sample ID   : 86-S14-069             Date Analyzed: 10/23/05 00:15
Lab Samp ID : J114-03                 Dilution Factor: 1
Lab File ID : RJQ725                 Matrix       : WATER
Ext Btch ID : V005J58                 % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	119	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	100	75-125

RL: Reporting Limit

2006

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/23/05 00:53
Sample ID   : 86-S14-072             Date Analyzed: 10/23/05 00:53
Lab Samp ID : J114-04                 Dilution Factor: 1
Lab File ID : RJQ726                 Matrix       : WATER
Ext Btch ID : V005J58                % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYL BENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	114	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2011

11/29/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 10/18/05
Project      : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.    : 05J114                       Date Extracted: 10/23/05 02:07
Sample ID:   86-S14-071                     Date Analyzed: 10/23/05 02:07
Lab Samp ID: J114-05                        Dilution Factor: 1
Lab File ID: RJQ728                         Matrix          : WATER
Ext Btch ID: V005J58                       % Moisture       : NA
Calib. Ref.: RIQ499                        Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	.71J	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	113	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2012

11/29/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 21:47
Sample ID   : 86-S14-065             Date Analyzed: 10/22/05 21:47
Lab Samp ID : J114-06                 Dilution Factor: 1
Lab File ID : RJQ721                 Matrix          : WATER
Ext Btch ID : V005J58                 % Moisture       : NA
Calib. Ref. : RIQ499                 Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2013

11/24/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 22:24
Sample ID   : 86-S14-073             Date Analyzed: 10/22/05 22:24
Lab Samp ID : J114-07                Dilution Factor: 1
Lab File ID : RJQ722                 Matrix       : WATER
Ext Btch ID : V005J58                % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	117	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2014

11/29/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 21:10
Sample ID   : 86-S14-064             Date Analyzed: 10/22/05 21:10
Lab Samp ID : J114-08                 Dilution Factor: 1
Lab File ID : RJQ720                 Matrix       : WATER
Ext Btch ID : V005J58                 % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	114	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2015

11/29/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86    Date Received: 10/19/05
Batch No.   : 05J114                     Date Extracted: 10/24/05 13:45
Sample ID   : 86-S14-067                 Date Analyzed: 10/24/05 13:45
Lab Samp ID : J114-09T                   Dilution Factor: 10
Lab File ID : RJQ742                     Matrix          : WATER
Ext Btch ID : V005J59                     % Moisture      : NA
Calib. Ref. : RIQ499                     Instrument ID   : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	550E J	10	2
TOLUENE	43	10	2
ETHYLBENZENE	43	10	2
XYLENES (TOTAL)	130	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	110	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2016

11/29/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : US1 SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                      Date Extracted: 10/24/05 15:55
Sample ID   : 86-S14-0670L               Date Analyzed: 10/24/05 15:55
Lab Samp ID : J114-091                   Dilution Factor: 250
Lab File ID : RJQ745                     Matrix       : WATER
Ext Btch ID : V005J59                     % Moisture    : NA
Calib. Ref. : RIQ499                     Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	8900	250	50
TOLUENE	60J	250	50
ETHYLBENZENE	65J	250	50
XYLENES (TOTAL)	260J	750	120
MTBE	ND	250	50

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	110	75-125
TOLUENE-D8	101	75-125

RL: Reporting Limit

2017

11/24/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86     Date Received: 10/19/05
Batch No.   : 05J114                       Date Extracted: 10/23/05 01:30
Sample ID:  B6-S14-066                     Date Analyzed: 10/23/05 01:30
Lab Samp ID: J114-10                       Dilution Factor: 1
Lab File ID: RJQ727                        Matrix       : WATER
Ext Btch ID: V005J58                       % Moisture    : NA
Calib. Ref.: RIQ499                        Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	50E J	1	.2
TOLUENE	5.4	1	.2
ETHYLBENZENE	.52J	1	.2
XYLENES (TOTAL)	12	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	117	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

2018

11/22/05

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/26/05 15:49
Sample ID: 86-S14-066DL              Date Analyzed: 10/26/05 15:49
Lab Samp ID: J114-10T                 Dilution Factor: 10
Lab File ID: RJQ780                  Matrix       : WATER
Ext Btch ID: V005J61                 % Moisture    : NA
Calib. Ref.: RIQ499                  Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	62	10	2
TOLUENE	6.4J	10	2
ETHYL BENZENE	ND	10	2
XYLENES (TOTAL)	15J	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	115	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	102	75-125

RL: Reporting Limit

2019

11/24/05

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 10/18/05
Project     : UST SITE 14, MFA, CTO 86 Date Received: 10/19/05
Batch No.   : 05J114                 Date Extracted: 10/22/05 23:01
Sample ID   : 86-S14-070             Date Analyzed: 10/22/05 23:01
Lab Samp ID : J114-11                 Dilution Factor: 1
Lab File ID : RJQ723                 Matrix       : WATER
Ext Btch ID : V005J58                 % Moisture    : NA
Calib. Ref. : RIQ499                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
1,2-DICHLOROETHANE-D4	118	65-135	
BROMOFLUOROBENZENE	108	75-125	
TOLUENE-D8	103	75-125	

RL: Reporting Limit

2020

11/29/05

LDC #: 14301A1

SDG #: 05J114

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/22/05

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/17-18/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	70 RSD. 82
IV.	Continuing calibration	A	70 D & 1 CV
V.	Blanks	A	
VI.	Surrogate spikes	D	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	D	100/0
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 2 + 3
XVII.	Field blanks	NO	TB = 1. 8

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-063	11	86-S14-066	21	MBK/W	31	
2	86-S14-068	12	86-S14-066DL	22	UBK2W	32	
3	86-S14-069**	13	86-S14-070	23	MBK3W	33	
4	86-S14-072	14		24		34	
5	86-S14-071	15		25		35	
6	86-S14-065	16		26		36	
7	86-S14-073	17		27		37	
8	86-S14-064	18		28		38	
9	86-S14-067	19		29		39	
10	86-S14-067DL	20		30		40	

LDC #: 4301A1
SDG #: 25114

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) $\leq 30\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) $\leq 25\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 14301A1
SDG #: 05J114

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: 9
2nd Reviewer: 2

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within + 20% between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Methyl ethyl ketone
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Ethyl ether
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Benzyl chloride
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QOOQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBB. tert-Amyl methyl ether	VVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 1430A1
SDG #: 05J14

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and CRQLs

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

<p>Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".</p> <p>Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?</p> <p>Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?</p>	<p>Y N N/A</p> <p>Y N N/A</p>
--	-------------------------------

[illegible]

Comments: See sample calculation worksheet for recalculations

LDC #: 14301A
SDG #: 05114

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$$RRF = (A_s/C_s)/(A_x/C_x)$$

average RRF = sum of the RRFs/number of standards

$$\%RSD = 100 * (S/X)$$

A_s = Area of compound,

C_s = Concentration of compound,

S = Standard deviation of the RRFs

X = Mean of the RRFs

A_x = Area of associated internal standard

C_x = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (std)	10 RRF (std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	KAC	9/21/05	Methylene chloride (1st internal standard)	0.371	0.371	0.355	0.355	6.70	6.66
			Trichlorethene (2nd internal standard)	1.598	1.598	1.558	1.558	3.34	3.34
			Toluene (3rd internal standard)						
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14301A1
SDG #: 05114

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 61
Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$

$$\text{RRF} = (A_x)(C_b) / (A_b)(C_x)$$

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound,
 C_x = Concentration of compound,
 A_b = Area of associated internal standard
 C_b = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	B1873		Methylene chloride (1st internal standard)	0.355	0.366	3.1	0.366	3.1
			Trichloroethene (2nd internal standard)		1.696	8.9	1.696	8.9
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 4301A1
SDG #: 05J114

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: f

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 3

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	9.95	108 100	100	0
Bromofluorobenzene	✓	10.79	108	108	✓
1,2-Dichloroethane-d4	✓	11.87	119	119	✓
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer: g
2nd Reviewer: g

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Recovery} = 100 * \text{SSC} / \text{SA}$$

Where: SSC = Spiked sample concentration
SA = Spike added

$$RPD = |LCS - LCSD| * 2 / (LCS + LCSD)$$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 2CS1/D1

Compound	Spike Added (<i>mg/L</i>)		Spiked Sample Concentration (<i>mg/L</i>)		LCS		LCSD		Percent Recovery		Percent Recovery		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
					Reported	Recalc.	Reported	Recalc.						
1,1-Dichloroethene														
Trichloroethene														
Benzene	10	10	10.8	10.9	108	108	109	109	1		1			
Toluene	✓	✓	11.5	11.6	115	115	116	116	1		1			
Chlorobenzene														

Comments: Refer to Laboratory Control Sample findings.

[illegible]

SDG #: 05114

Sample Calculation Verification

Page: 1 of 1

Reviewer: 9

2nd reviewer: _____

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A

Were all reported results recalculated and verified for all level IV samples?

Y/N N/A

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_s)(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_g = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 3, ND

$$\text{Conc.} = \frac{(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)}$$
[illegible]



TETRA TECH

1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

CHAIN-OF-CUSTODY RECORD

NUMBER 10869

PROJECT NAME UST Site 14 - R4 106		PURCHASE ORDER NO. 20818 - Box 33		ANALYSES REQUIRED										LABORATORY NAME LVIAX		Project Information Section Do not submit to Laboratory						
PROJECT LOCATION Moffett FA		PROJECT NO. 1990.08602												LABORATORY ID (FOR LABORATORY) 06A085								
SAMPLER NAME Duane Harrison		AIRBILL NUMBER 75190312746														LOCATION Trip Blank			DEPTH START END		QC	
PROJECT CONTACT Lynn Jefferson		PROJECT CONTACT PHONE NUMBER 503/456-7224												COMMENTS								
SAMPLE ID		DATE COLLECTED		TIME COLLECTED		NO. OF CONTAINER		LEVEL		TYPE		T		A		T		T				
86-S14-083		1-16-06		1055		6		3		4		W		W		W		13				
86-S14-074		1-16-06		1105		6		3		4		W		W		W		Reg				
86-S14-075		1-16-06		1150		6		3		4		W		W		W		Reg				
86-S14-078		1-16-06		1220		18		3		4		W		W		W		Reg				
86-S14-079		1-16-06		1420		6		3		4		W		W		W		Reg				
86-S14-080		1-16-06		1440		6		3		4		W		W		W		Reg				
86-S14-081		1-16-06		1456		6		3		4		W		W		W		FD				
86-S14-076		1-16-06		1530		6		3		4		W		W		W		Reg				
86-S14-077		1-17-06		0855		6		3		4		W		W		W		Reg				
86-S14-082		1-17-06		1950		6		3		4		W		W		W		Reg				
RELINQUISHED BY (Signature) [Signature]		DATE 1-17-06		TIME 1950		RECEIVED BY (Signature) [Signature]		COMPANY		LABORATORY INSTRUCTIONS/COMMENTS										SAMPLING COMMENT: UST Site 14 R4 106		
COMPANY		DATE		TIME		RECEIVED BY (Signature)		COMPANY		COMPOSITE DESCRIPTION												
RELINQUISHED BY (Signature)		DATE		TIME		RECEIVED BY (Signature)		COMPANY		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY) TEMPERATURE: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN												
COMPANY		DATE		TIME		RECEIVED BY (Signature)		COMPANY														

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 06A085

SW 5030B/8260B VOLATILE ORGANICS BY GC/MS

Ten (10) water samples were received on 01/18/06 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample A085-04 was spiked. All recoveries were within QC limit.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

Sample A085-08 was initially analyzed at 10x dilution due to high concentration of the sample.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS

Client : TETRA TECH EC, INC
Project : UST SITE 14, WPA, CTO 86

SDG NO. : 06A085
Instrument ID : T-005

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBL11W	V005A44Q	1	NA	01/24/0602:31			01/24/0602:31	RA0493	RL0208	V005A44	Method Blank
LCS1W	V005A44L	1	NA	01/24/0600:42			01/24/0600:42	RA0490	RL0208	V005A44	Lab Control Sample (LCS)
	V005A44C	1	NA	01/24/0601:18			01/24/0601:18	RA0491	RL0208	V005A44	LCS Duplicate
86-S14-083	A085-01	1	NA	01/24/0603:07			01/24/0603:07	RA0494	RL0208	V005A44	Field Sample
86-S14-074	A085-02	1	NA	01/24/0603:43			01/24/0603:43	RA0495	RL0208	V005A44	Field Sample
86-S14-075	A085-03	1	NA	01/24/0604:19			01/24/0604:19	RA0496	RL0208	V005A44	Field Sample
86-S14-078	A085-04	1	NA	01/24/0604:55			01/24/0604:55	RA0497	RL0208	V005A44	Field Sample
86-S14-081	A085-07	1	NA	01/24/0605:32			01/24/0605:32	RA0498	RL0208	V005A44	Field Sample
86-S14-077	A085-09	1	NA	01/24/0606:08			01/24/0606:08	RA0499	RL0208	V005A44	Field Sample
86-S14-082	A085-10	1	NA	01/24/0606:43			01/24/0606:43	RA0500	RL0208	V005A44	Field Sample
86-S14-079	A085-05	1	NA	01/24/0607:19			01/24/0607:19	RA0501	RL0208	V005A44	Field Sample
86-S14-080	A085-06	1	NA	01/24/0607:56			01/24/0607:56	RA0502	RL0208	V005A44	Field Sample
86-S14-078MS	A085-04M	1	NA	01/24/0608:32			01/24/0608:32	RA0503	RL0208	V005A44	Matrix Spike Sample (MS)
86-S14-078MSD	A085-04S	1	NA	01/24/0609:09			01/24/0609:09	RA0504	RL0208	V005A44	MS Duplicate (MSD)
86-S14-076	A085-08	10	NA	01/24/0610:22			01/24/0610:22	RA0506	RL0208	V005A44	Field Sample
MBL12W	V005A47Q	1	NA	01/25/0603:53			01/25/0603:53	RA0535	RL0208	V005A47	Method Blank
LCS2W	V005A47L	1	NA	01/25/0602:05			01/25/0602:05	RA0532	RL0208	V005A47	Lab Control Sample (LCS)
	V005A47C	1	NA	01/25/0602:41			01/25/0602:41	RA0533	RL0208	V005A47	LCS Duplicate
86-S14-0760L	A085-08T	250	NA	01/25/0611:08			01/25/0611:08	RA0547	RL0208	V005A47	Diluted Sample

FN : Filename
% Moist : Percent Moisture

2002

SAMPLE RESULTS

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MPA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 03:07
Sample ID: 86-S14-083                Date Analyzed: 01/24/06 03:07
Lab Samp ID: A085-01                 Dilution Factor: 1
Lab File ID: RA0494                  Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                  Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.   : 06A085                       Date Extracted: 01/24/06 03:43
Sample ID   : 86-S14-074                   Date Analyzed: 01/24/06 03:43
Lab Samp ID : A085-02                       Dilution Factor: 1
Lab File ID : RAQ495                       Matrix          : WATER
Ext Btch ID : V005A44                       % Moisture      : NA
Calib. Ref. : RLQ208                       Instrument ID   : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO B6 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/24/06 04:19
Sample ID    : 86-S14-075             Date Analyzed: 01/24/06 04:19
Lab Samp ID  : A085-03                 Dilution Factor: 1
Lab File ID  : RAQ496                 Matrix       : WATER
Ext Btch ID  : V005A44                 % Moisture   : NA
Calib. Ref.  : RLQ208                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```
=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 04:55
Sample ID: 86-S14-078                Date Analyzed: 01/24/06 04:55
Lab Samp ID: A085-04                 Dilution Factor: 1
Lab File ID: RA0497                 Matrix      : WATER
Ext Btch ID: V005A44                % Moisture   : NA
Calib. Ref.: RLQ208                 Instrument ID : Y-005
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                      Date Extracted: 01/24/06 07:19
Sample ID    : 86-S14-079                  Date Analyzed: 01/24/06 07:19
Lab Samp ID  : A085-05                     Dilution Factor: 1
Lab File ID  : RAQ501                      Matrix          : WATER
Ext Btch ID  : V005A44                     % Moisture      : NA
Calib. Ref.  : RLQ208                      Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	31	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.   : 06A085                      Date Extracted: 01/24/06 07:56
Sample ID: 86-S14-080.                   Date Analyzed: 01/24/06 07:56
Lab Samp ID: A085-06                     Dilution Factor: 1
Lab File ID: RAQ502                      Matrix       : WATER
Ext Btch ID: V005A44                     % Moisture   : NA
Calib. Ref.: RLQ208                      Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	31	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	94	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

Quantitation Report (QT Reviewed)

 Data File : D:\HPCHEM\1\DATA\06A23\RAQ502.D
 Acq On : 24 Jan 2006 7:56 am
 Sample : 06A085-06 25ml
 Misc : DF=1.0

 Vial: 17
 Operator: DN
 Inst : T005
 Multiplr: 1.00

MS Integration Params: 524TAIL.P

Quant Time: Jan 24 10:25 2006

Quant Results File: VO05L08.RES

Quant Method : D:\HPCHEM\1\METHODS\VO05L08.M (RTE Integrator)

Title : METHOD 8260

Last Update : Fri Dec 09 09:39:40 2005

Response via : Initial Calibration

DataAcq Meth : VO05L08

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-DIFLUOROBENZENE	8.54	114	1524775	10.00	ug/l	0.01
37) CHLOROBENZENE-D5	14.44	117	1190128	10.00	ug/l	0.01
68) 1,2-DICHLOROBENZENE-D4	20.73	152	383830	10.00	ug/l	0.01
System Monitoring Compounds						
36) 1,2-Dichloroethane-d4	7.84	65	359855	9.43	ug/l	0.01
Spiked Amount 10.000			Recovery	=	94.30%	
50) Toluene-d8	11.34	98	1704687	10.83	ug/l	0.01
Spiked Amount 10.000			Recovery	=	108.30%	
72) 4-Bromofluorobenzene	17.16	95	507208	10.52	ug/l	0.01
Spiked Amount 10.000			Recovery	=	105.20%	
Target Compounds						
17) Methylene chloride	4.43	49	11195	0.21	ug/l	77
18) Carbon disulfide	4.41	76	55112	0.44	ug/l	77
22) Isopropyl ether (DIPE)	5.38	45	1184925	8.95	ug/l	94
40) 1,2-Dichloroethane	8.00	62	198031	4.12	ug/l	99
41) Benzene	8.01	78	5983940	30.75	ug/l	99
65) m-Xylene & p-Xylene	14.85	91	31091	0.19	ug/l	89
66) o-Xylene	15.81	91	16239	0.10	ug/l	66
80) tert-Butylbenzene	18.74	119	74102	0.51	ug/l	100
82) sec-Butylbenzene	19.24	105	77734	0.38	ug/l	97

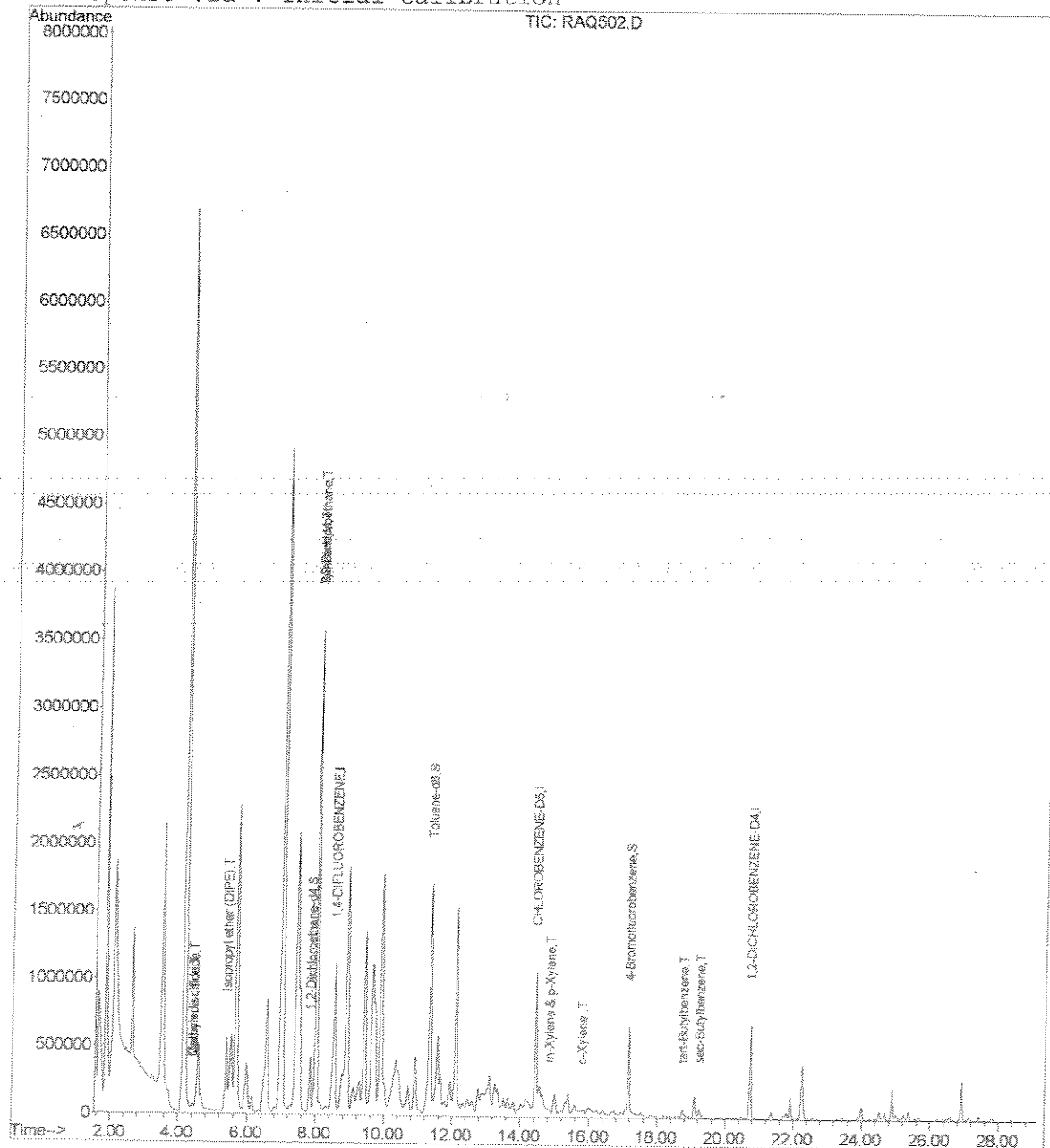
Quantitation Report

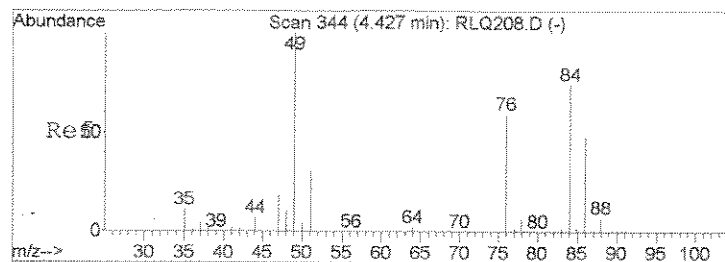
Data File : D:\HPCHEM\1\DATA\06A23\RAQ502.D
Acq On : 24 Jan 2006 7:56 am
Sample : 06A085-06 25ml
Misc : DF=1.0
MS Integration Params: 524TAIL.P
Quant Time: Jan 24 10:25 2006

Vial: 17
Operator: DN
Inst : T005
Multiplr: 1.00

Quant Results File: VO05L08.RE

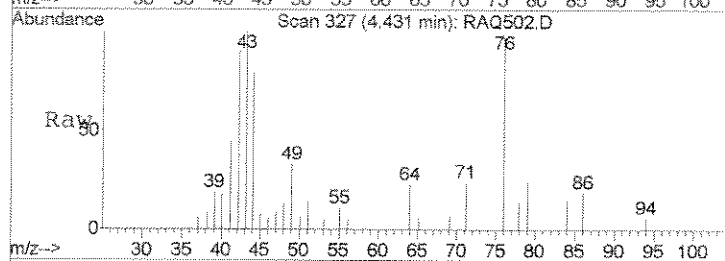
Method : D:\HPCHEM\1\METHODS\VO05L08.M (RTE Integrator)
Title : METHOD 8260
Last Update : Fri Dec 09 09:39:40 2005
Response via : Initial Calibration



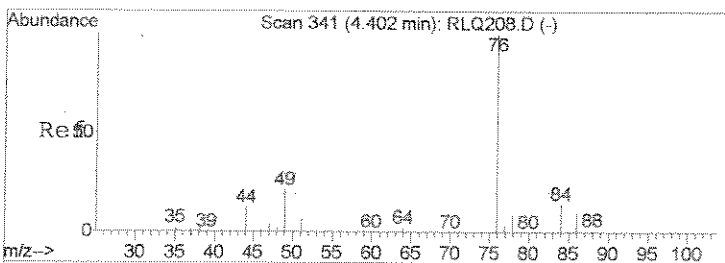
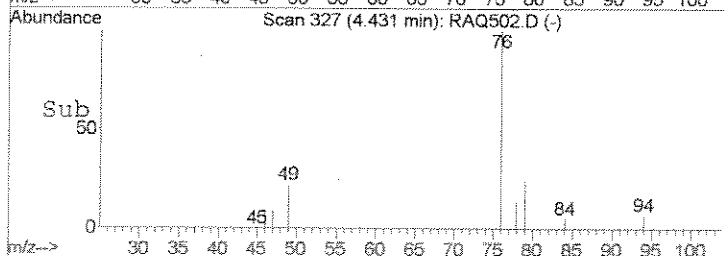
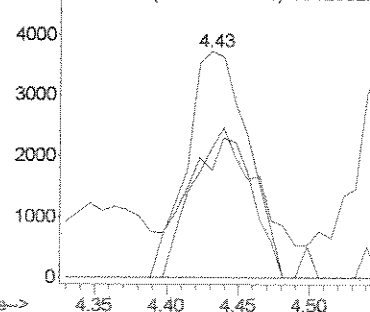


#17
Methylene chloride
Concen: 0.21 ug/l
RT: 4.43 min Scan# 327
Delta R.T. 0.00 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 49 Resp: 11195
Ion Ratio Lower Upper
49 100
84 63.4 43.1 103.1
86 74.7 17.6 77.6

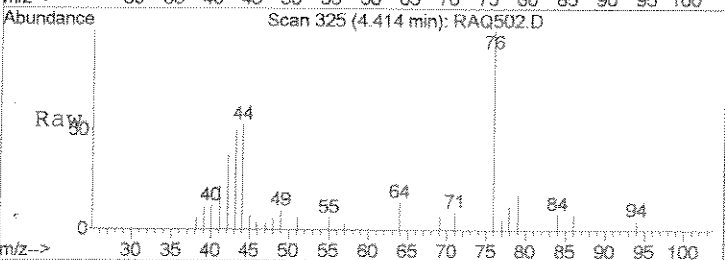


Abundance Ion 49.00 (48.70 to 49.70): RAQ502.D
5000 Ion 84.00 (83.70 to 84.70): RAQ502.D
Ion 86.00 (85.70 to 86.70): RAQ502.D

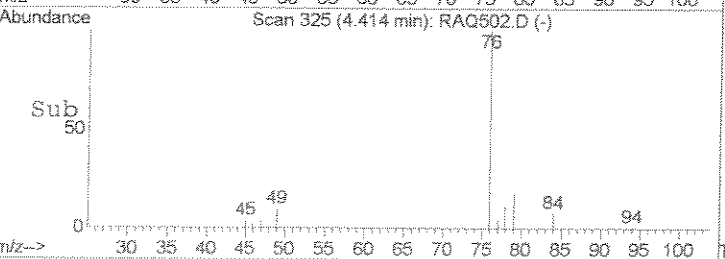
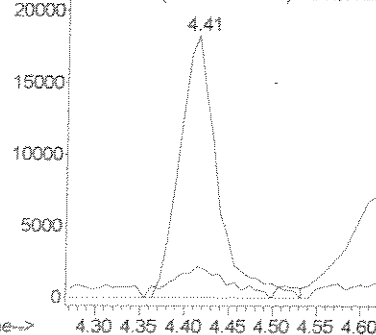


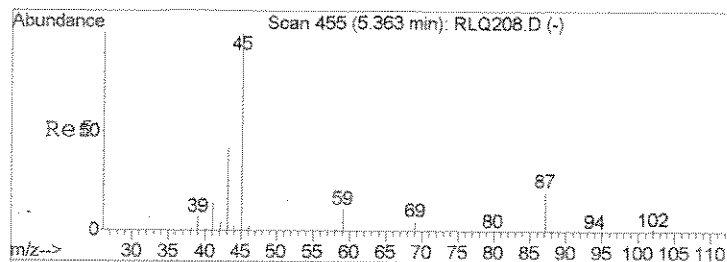
#18
Carbon disulfide
Concen: 0.44 ug/l
RT: 4.41 min Scan# 325
Delta R.T. 0.01 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 76 Resp: 55112
Ion Ratio Lower Upper
76 100
78 17.4 0.0 39.2



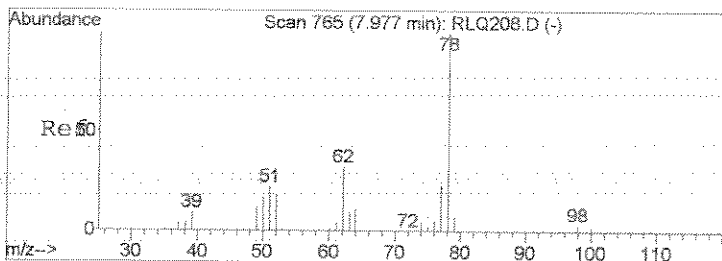
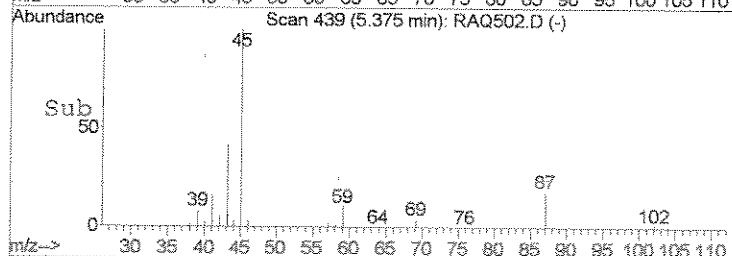
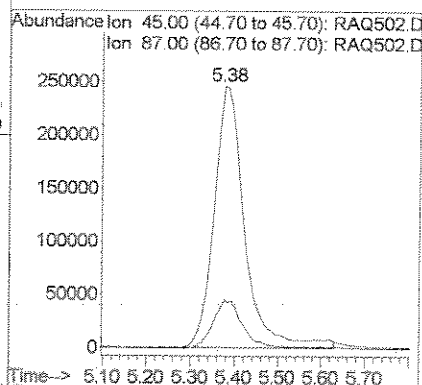
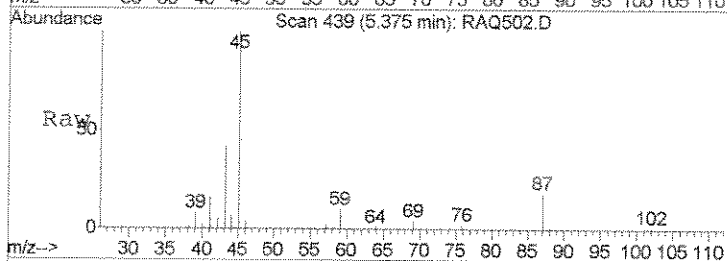
Abundance Ion 76.00 (75.70 to 76.70): RAQ502.D
Ion 78.00 (77.70 to 78.70): RAQ502.D





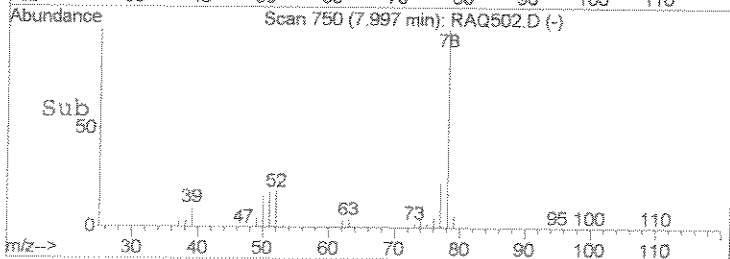
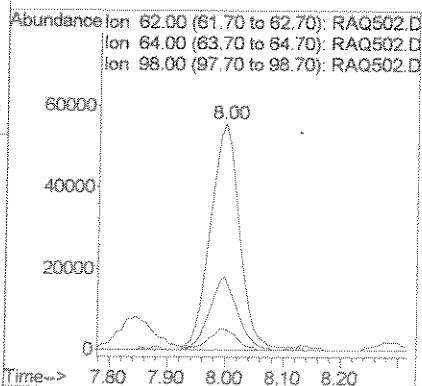
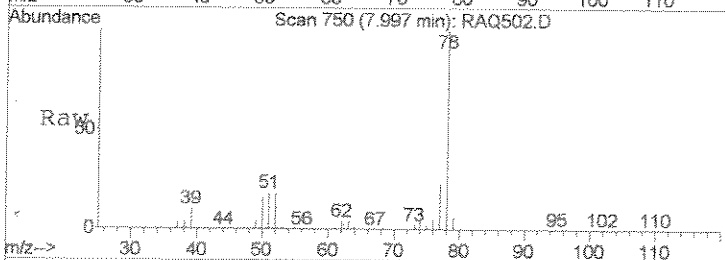
#22
Isopropyl ether (DIPE)
Concen: 8.95 ug/l
RT: 5.38 min Scan# 439
Delta R.T. 0.01 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

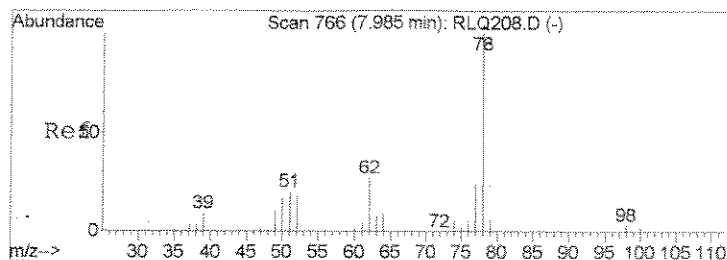
Tgt Ion: 45 Resp: 1184925
Ion Ratio Lower Upper
45 100
87 18.6 6.5 36.5



#40
1,2-Dichloroethane
Concen: 4.12 ug/l
RT: 8.00 min Scan# 750
Delta R.T. 0.02 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

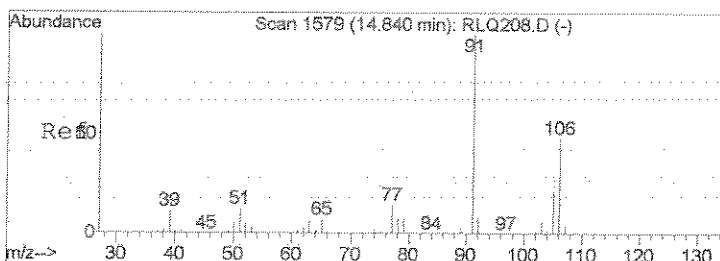
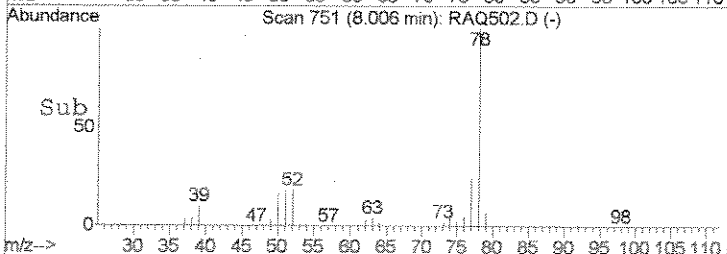
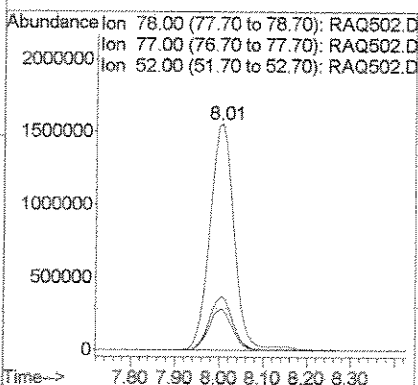
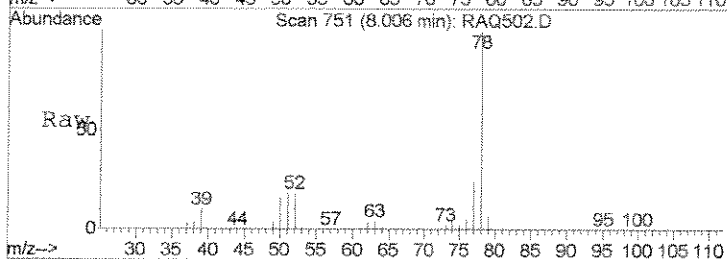
Tgt Ion: 62 Resp: 198031
Ion Ratio Lower Upper
62 100
64 30.6 1.5 61.5
98 8.9 0.0 39.2





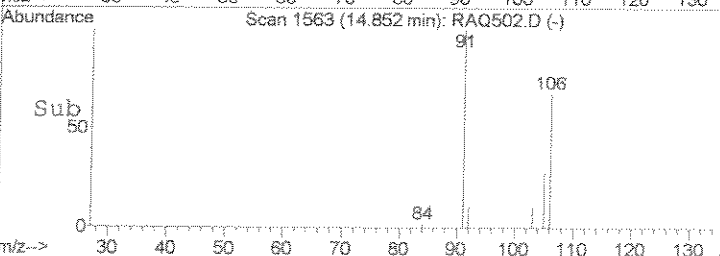
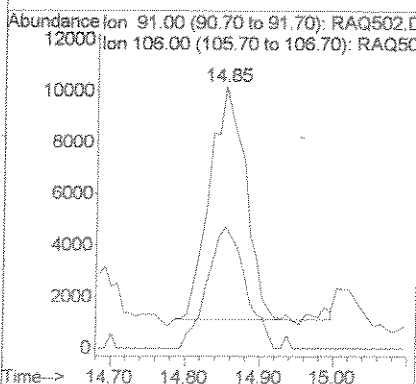
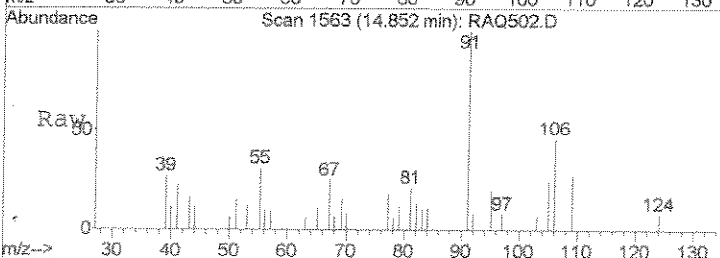
#41
Benzene
Concen: 30.75 ug/l
RT: 8.01 min Scan# 751
Delta R.T. 0.02 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 78 Resp: 5983940
Ion Ratio Lower Upper
78 100
77 23.7 0.0 53.3
52 18.2 0.0 47.9

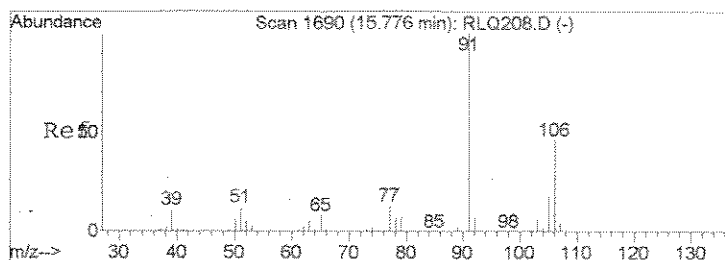


#65
m-Xylene & p-Xylene
Concen: 0.19 ug/l
RT: 14.85 min Scan# 1563
Delta R.T. 0.01 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 91 Resp: 31091
Ion Ratio Lower Upper
91 100
106 54.4 17.1 77.1

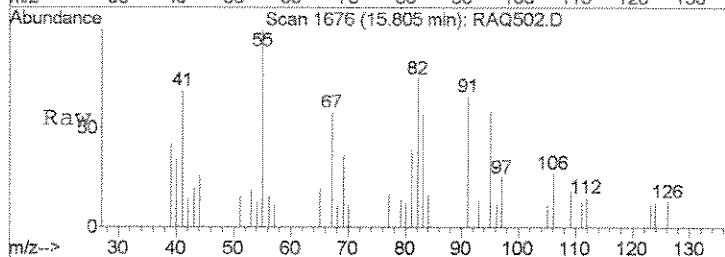


2014

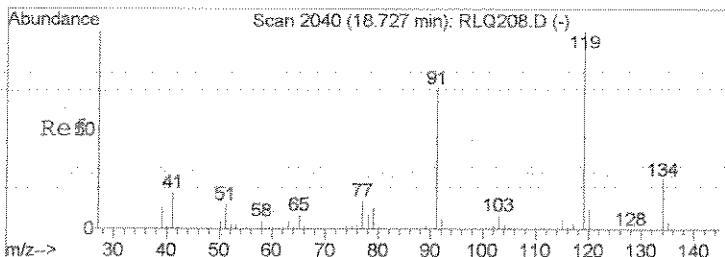
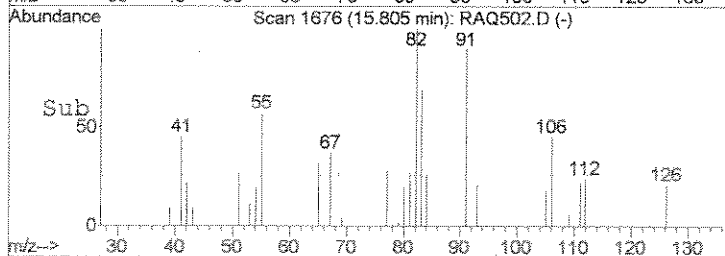
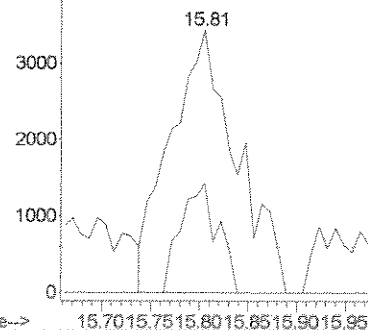


#66
o-Xylene
Concen: 0.10 ug/l
RT: 15.81 min Scan# 1676
Delta R.T. 0.03 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 91 Resp: 16239
Ion Ratio Lower Upper
91 100
106 23.5 16.1 76.1

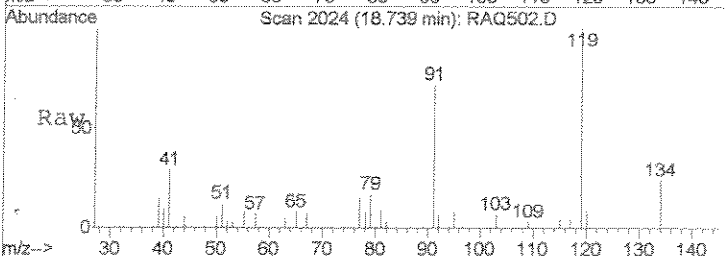


Abundance Ion 91.00 (90.70 to 91.70): RAQ502.D
4000 Ion 106.00 (105.70 to 106.70): RAQ502.D

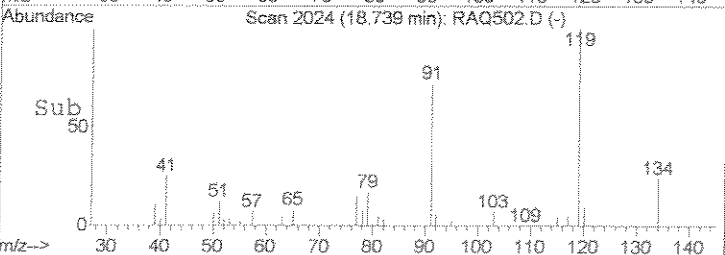
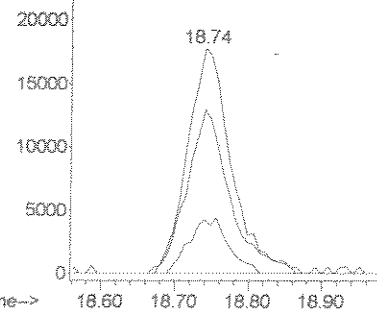


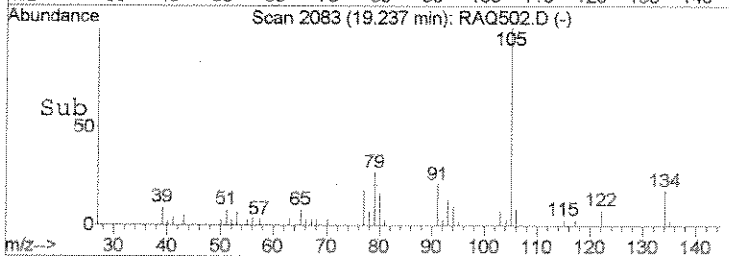
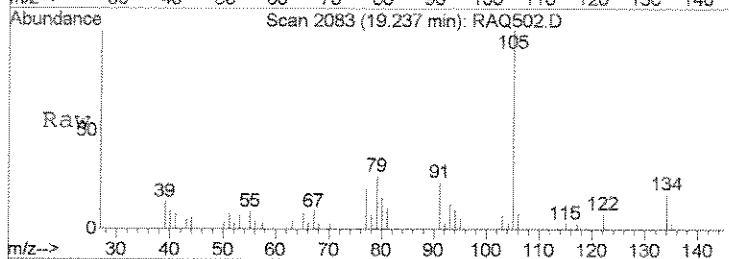
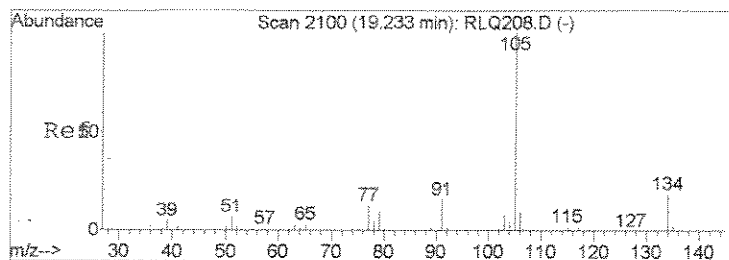
#80
tert-Butylbenzene
Concen: 0.51 ug/l
RT: 18.74 min Scan# 2024
Delta R.T. 0.01 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion: 119 Resp: 74102
Ion Ratio Lower Upper
119 100
91 72.0 42.4 102.4
134 22.1 0.0 51.9



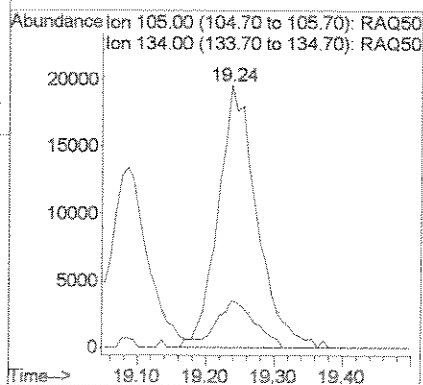
Abundance Ion 119.00 (118.70 to 119.70): RAQ502.D
Ion 91.00 (90.70 to 91.70): RAQ502.D
Ion 134.00 (133.70 to 134.70): RAQ502.D





#82
sec-Butylbenzene
Concen: 0.38 ug/l
RT: 19.24 min Scan# 2083
Delta R.T. 0.00 min
Lab File: RAQ502.D
Acq: 24 Jan 2006 7:56 am

Tgt Ion:105 Resp: 77734
Ion Ratio Lower Upper
105 100
134 17.3 0.0 48.6



SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.   : 06A085                       Date Extracted: 01/24/06 05:32
Sample ID: 86-S14-081.                     Date Analyzed: 01/24/06 05:32
Lab Samp ID: A085-07                       Dilution Factor: 1
Lab File ID: RAQ498                        Matrix       : WATER
Ext Btch ID: V005A44                       % Moisture    : NA
Calib. Ref.: RLQ208                        Instrument ID : T-005
=====

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PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTD B6 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 10:22
Sample ID: 86-S14-076                Date Analyzed: 01/24/06 10:22
Lab Samp ID: A085-08                  Dilution Factor: 10
Lab File ID: RAQ506                  Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                  Instrument ID : I-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	770E	10	2
TOLUENE	39	10	2
ETHYLBENZENE	15	10	2
XYLENES (TOTAL)	120	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/25/06 11:08
Sample ID: 86-S14-076DL              Date Analyzed: 01/25/06 11:08
Lab Samp ID: A085-08T                Dilution Factor: 250
Lab File ID: RA0547                  Matrix       : WATER
Ext Btch ID: V005A47                 % Moisture    : NA
Calib. Ref.: RLQ208                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	8200	250	50
TOLUENE	ND	250	50
ETHYLBENZENE	ND	250	50
XYLENES (TOTAL)	ND	750	120
MTBE	ND	250	50

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 01/17/06
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/24/06 06:08
Sample ID:   86-S14-077               Date Analyzed: 01/24/06 06:08
Lab Samp ID: A085-09                  Dilution Factor: 1
Lab File ID: RA0499                   Matrix          : WATER
Ext Btch ID: V005A44                  % Moisture       : NA
Calib. Ref.: RLQ208                   Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/17/06
Project     : UST SITE 14, MFA, CTO B6 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 06:43
Sample ID   : 86-S14-082             Date Analyzed: 01/24/06 06:43
Lab Samp ID : A085-10                Dilution Factor: 1
Lab File ID : RAQ500                 Matrix       : WATER
Ext Btch ID : V005A44                % Moisture   : NA
Calib. Ref. : RLQ208                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

CASE NARRATIVE

CLIENT: TETRA TECH EC, INC
PROJECT: UST SITE 14, MFA, CTO 86
SDG: 06A085

METHOD 5030B/M8015 TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Ten (10) water samples were received on 01/18/06 for Total Petroleum Hydrocarbons by Purge and Trap analysis by Method 5030B/M8015 in accordance with SW846 3rd Edition.

1. Holding Time

Analytical holding time was met. Water samples were preserved.

2. Calibration

Initial calibration was seven points. %RSD was within 20%. Continuing calibrations were carried out within 12-hour intervals and at the end of the analysis sequence. All recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at the reporting limit.

4. Surrogate Recovery

Surrogate recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample A085-04 was spiked. All recoveries were within QC limits

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Results were quantified from C₆ to C₁₀ using GRO (C₆ - C₁₀) calibration factor.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : TETRA TECH EC, INC
Project : UST SITE 14, MFA, CTO 86
SDG NO. : 06A085
Instrument ID : GCT039

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	VA39A13B	1	NA	01/19/0613:51	01/19/0613:51	EA19006A	EA19003A	VA39A13	Method Blank
LCS1W	VA39A14L	1	NA	01/19/0616:25	01/19/0616:25	EA19010A	EA19003A	VA39A13	Lab Control Sample (LCS)
LCD1W	VA39A14C	1	NA	01/19/0617:04	01/19/0617:04	EA19011A	EA19003A	VA39A13	LCS Duplicate
86-S14-083	A085-01	1	NA	01/20/0600:05	01/20/0600:05	EA19022A	EA19018A	VA39A13	Field Sample
86-S14-074	A085-02	1	NA	01/20/0600:43	01/20/0600:43	EA19023A	EA19018A	VA39A13	Field Sample
86-S14-075	A085-03	1	NA	01/20/0610:03	01/20/0610:03	EA19036A	EA19031A	VA39A13	Field Sample
86-S14-078	A085-04	1	NA	01/20/0610:41	01/20/0610:41	EA19025A	EA19018A	VA39A13	Field Sample
86-S14-079	A085-05	1	NA	01/20/0611:59	01/20/0611:59	EA19037A	EA19031A	VA39A13	Field Sample
86-S14-080	A085-06	1	NA	01/20/0611:20	01/20/0611:20	EA19038A	EA19018A	VA39A13	Field Sample
86-S14-081	A085-07	1	NA	01/20/0605:10	01/20/0605:10	EA19030A	EA19031A	VA39A13	Field Sample
86-S14-076	A085-08T	10	NA	01/20/0611:58	01/20/0611:58	EA19039A	EA19031A	VA39A13	Diluted Sample
86-S14-077	A085-09	1	NA	01/20/0607:42	01/20/0607:42	EA19036A	EA19031A	VA39A13	Field Sample
86-S14-082	A085-10	1	NA	01/20/0608:20	01/20/0608:20	EA19035A	EA19031A	VA39A13	Field Sample
86-S14-078MS	A085-04M	1	NA	01/20/0602:37	01/20/0602:37	EA19026A	EA19018A	VA39A13	Matrix Spike Sample (MS)
86-S14-078MSD	A085-04S	1	NA	01/20/0603:15	01/20/0603:15	EA19027A	EA19018A	VA39A13	MS Duplicate (MSD)

FN : Filename
% Moist : Percent Moisture

SAMPLE RESULTS

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 00:05
Sample ID    : 86-S14-083                   Date Analyzed: 01/20/06 00:05
Lab Samp ID  : A085-01                      Dilution Factor: 1
Lab File ID  : EA19022A                     Matrix       : WATER
Ext Btch ID  : VA39A13                      % Moisture    : NA
Calib. Ref.  : EA19018A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	89	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```
=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 00:43
Sample ID    : 86-S14-074                   Date Analyzed: 01/20/06 00:43
Lab Samp ID  : A085-02                       Dilution Factor: 1
Lab File ID  : EA19023A                      Matrix       : WATER
Ext Btch ID  : VA39A13                       % Moisture    : NA
Calib. Ref.  : EA19018A                      Instrument ID : GCT039
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	85	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 10:03
Sample ID:   86-S14-075                     Date Analyzed: 01/20/06 10:03
Lab Samp ID: A085-03                         Dilution Factor: 1
Lab File ID: EA19036A                       Matrix          : WATER
Ext Btch ID: VA39A13                        % Moisture       : NA
Calib. Ref.: EA19031A                       Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 01:59
Sample ID    : 86-S14-078                   Date Analyzed: 01/20/06 01:59
Lab Samp ID  : A085-04                       Dilution Factor: 1
Lab File ID  : EA19025A                      Matrix       : WATER
Ext Btch ID  : VA39A13                       % Moisture    : NA
Calib. Ref.  : EA19018A                      Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	87	65-135	

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```
=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO B6     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 10:41
Sample ID    : 86-S14-079                   Date Analyzed: 01/20/06 10:41
Lab Samp ID  : A085-05                       Dilution Factor: 1
Lab File ID  : EA19037A                      Matrix       : WATER
Ext Btch ID  : VA39A13                       % Moisture    : NA
Calib. Ref.  : EA19031A                      Instrument ID : GCT039
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.21	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                      Date Extracted: 01/20/06 11:20
Sample ID    : 86-S14-080                  Date Analyzed: 01/20/06 11:20
Lab Samp ID  : A085-06                     Dilution Factor: 1
Lab File ID  : EA19038A                    Matrix       : WATER
Ext Btch ID  : VA39A13                     % Moisture    : NA
Calib. Ref.  : EA19031A                    Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.27	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	100	65-135

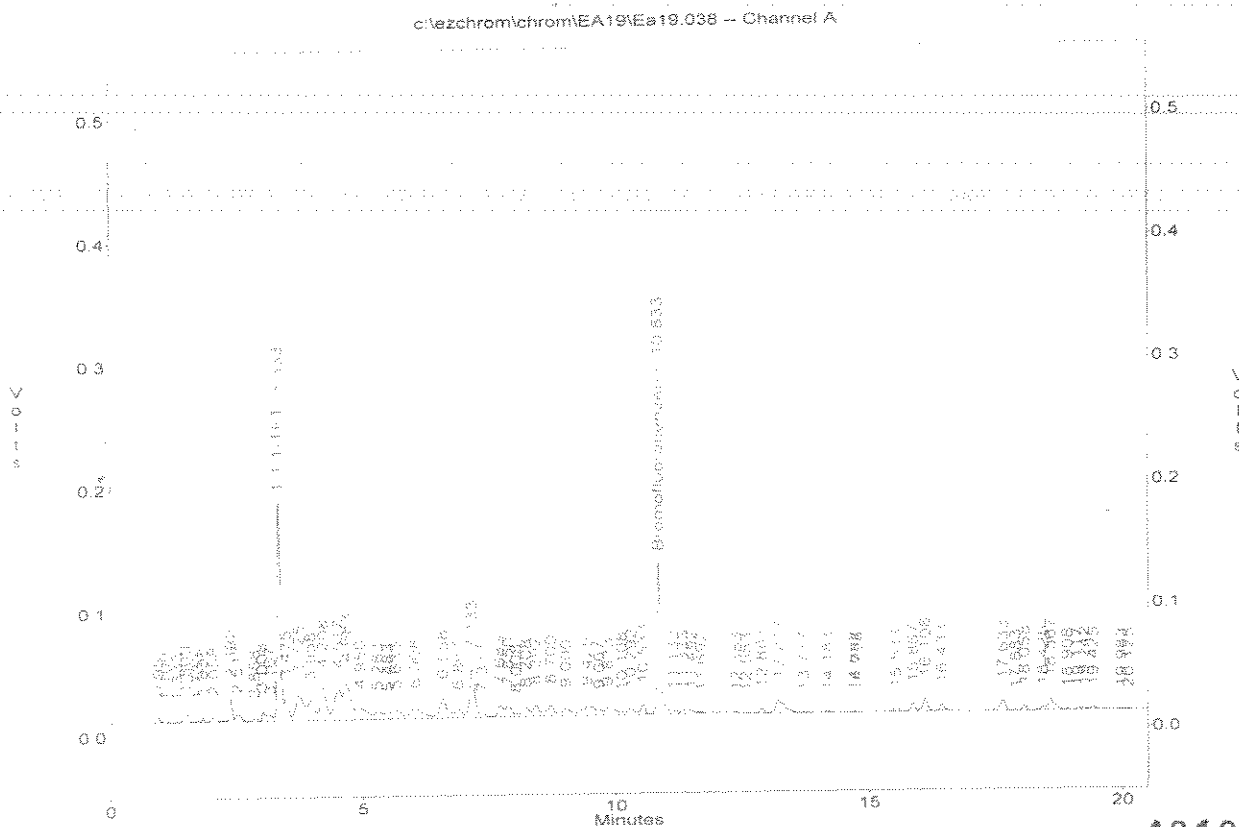
RL : Reporting Limit

METHOD 8015 by FID
EMAX Analytical Laboratories, Inc.

File : c:\ezchrom\chrom\EA19\EA19.038
Method : c:\ezchrom\methods\Vg39107.met
Sample ID : 06A085-06 5.0ML W
Acquired : Jan 20, 2006 11:20:34
Printed : Jan 20, 2006 11:41:06
User : SERGIO

Channel A Results

#	Peak Name	Ret.Time(Min)	Area	Ave. CF	ESTD Conc.(PPB)
13	1,1,1-TFT	3.333	833204.0	22272.6	37.41
42	Bromofluorobenzene	10.833	632459.0	15780.6	40.08
G1	GASOLINE(TOTAL)		4130035.0	15755.5	262.13
G2	GRO(C6-C10)		3436825.0	12810.6	268.28
G3	GRO(2MP-124TMB)		3495069.0	12825.0	272.52
G4	GRO(C5-C12)		4056442.0	15518.7	261.39



4010

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```
=====
Client       : TETRA TECH EC, INC      Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/20/06 05:10
Sample ID    : 86-S14-081             Date Analyzed: 01/20/06 05:10
Lab Samp ID  : A085-07                Dilution Factor: 1
Lab File ID  : EA19030A               Matrix       : WATER
Ext Btch ID  : VA39A13                % Moisture    : NA
Calib. Ref. : EA19018A                Instrument ID : GCT039
=====
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

METHOD 5030B/MB015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                      Date Extracted: 01/20/06 11:58
Sample ID:   86-S14-076                    Date Analyzed: 01/20/06 11:58
Lab Samp ID: A085-08T                      Dilution Factor: 10
Lab File ID: EA19039A                     Matrix       : WATER
Ext Btch ID: VA39A13                      % Moisture    : NA
Calib. Ref.: EA19031A                     Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	2.9	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/17/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/20/06 07:42
Sample ID    : 86-S14-077                   Date Analyzed: 01/20/06 07:42
Lab Samp ID  : A085-09                      Dilution Factor: 1
Lab File ID  : EA19034A                     Matrix          : WATER
Ext Btch ID  : VA39A13                      % Moisture       : NA
Calib. Ref.  : EA19031A                     Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 01/17/06
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/20/06 08:20
Sample ID    : 86-S14-082             Date Analyzed: 01/20/06 08:20
Lab Samp ID  : A085-10                Dilution Factor: 1
Lab File ID  : EA19035A               Matrix       : WATER
Ext Btch ID  : VA39A13                % Moisture    : NA
Calib. Ref.  : EA19031A               Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	88	65-135	

RL : Reporting Limit

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Airfield, UST Site 14, CTO 86
Collection Date: January 16 through January 17, 2006
LDC Report Date: February 21, 2006
Matrix: Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 06A085

Sample Identification

86-S14-083
86-S14-074
86-S14-075
86-S14-078
86-S14-079
86-S14-080**
86-S14-081
86-S14-076
86-S14-077
86-S14-082
86-S14-078MS
86-S14-078MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015B for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 86-S14-079 and 86-S14-080** were identified as field duplicates. No total petroleum hydrocarbons as gasoline were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	86-S14-079	86-S14-080**	
TPH as gasoline	0.21	0.27	25

X. Field Blanks

Sample 86-S14-083 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

Moffett Airfield, UST Site 14, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG 06A085

No Sample Data Qualified in this SDG

Moffett Airfield, UST Site 14, CTO 86
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG 06A085

No Sample Data Qualified in this SDG

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/20/06 00:05
Sample ID: 86-S14-083                     Date Analyzed: 01/20/06 00:05
Lab Samp ID: A085-01                       Dilution Factor: 1
Lab File ID: EA19022A                     Matrix          : WATER
Ext Btch ID: VA39A13                      % Moisture       : NA
Calib. Ref.: EA19018A                     Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	89	65-135

RL : Reporting Limit

4004

2/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/20/06 00:43
Sample ID: 86-S14-074                    Date Analyzed: 01/20/06 00:43
Lab Samp ID: A085-02                      Dilution Factor: 1
Lab File ID: EA19023A                     Matrix       : WATER
Ext Btch ID: VA39A13                      % Moisture    : NA
Calib. Ref.: EA19018A                     Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	85	65-135

RL : Reporting Limit

4005

2/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.   : 06A085                      Date Extracted: 01/20/06 10:03
Sample ID   : 86-S14-075                  Date Analyzed: 01/20/06 10:03
Lab Samp ID : A085-03                     Dilution Factor: 1
Lab File ID : EA19036A                    Matrix       : WATER
Ext Btch ID : VA39A13                     % Moisture    : NA
Calib. Ref. : EA19031A                    Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

4006

1/27/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/20/06 01:59
Sample ID   : 86-S14-078                 Date Analyzed: 01/20/06 01:59
Lab Samp ID : A085-04                    Dilution Factor: 1
Lab File ID : EA19025A                   Matrix       : WATER
Ext Btch ID : VA39A13                    % Moisture    : NA
Calib. Ref. : EA19018A                   Instrument ID : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02
SURROGATE PARAMETERS			
	% RECOVERY	QC LIMIT	
BROMOFLUOROBENZENE	87	65-135	

RL : Reporting Limit

4007

2/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO B6   Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/20/06 10:41
Sample ID   : 86-S14-079                 Date Analyzed: 01/20/06 10:41
Lab Samp ID : A085-05                    Dilution Factor: 1
Lab File ID : EA19037A                   Matrix          : WATER
Ext Btch ID : VA39A13                    % Moisture       : NA
Calib. Ref. : EA19031A                   Instrument ID    : GCT039
=====

```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.21	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	65-135

RL : Reporting Limit

4008

5/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/20/06 11:20
Sample ID    : 86-S14-080             Date Analyzed: 01/20/06 11:20
Lab Samp ID  : A085-06                 Dilution Factor: 1
Lab File ID  : EA19038A                Matrix          : WATER
Ext Btch ID  : VA39A13                 % Moisture       : NA
Calib. Ref.  : EA19031A                Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	.27	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	100	65-135

RL : Reporting Limit

4009

2/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/20/06 05:10
Sample ID   : 86-S14-081             Date Analyzed: 01/20/06 05:10
Lab Samp ID : A085-07                Dilution Factor: 1
Lab File ID : EA19030A               Matrix       : WATER
Ext Btch ID : VA39A13                % Moisture    : NA
Calib. Ref. : EA19018A               Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

Handwritten: 5/2/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC           Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.   : 06A085                       Date Extracted: 01/20/06 11:58
Sample ID   : 86-S14-076                   Date Analyzed: 01/20/06 11:58
Lab Samp ID : A085-08T                      Dilution Factor: 10
Lab File ID : EA19039A                      Matrix          : WATER
Ext Btch ID : VA39A13                       % Moisture       : NA
Calib. Ref. : EA19031A                      Instrument ID    : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	2.9	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	98	65-135

RL : Reporting Limit

Handwritten: 2/21/06

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/17/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/20/06 07:42
Sample ID: 86-S14-077                Date Analyzed: 01/20/06 07:42
Lab Samp ID: A085-09                  Dilution Factor: 1
Lab File ID: EA19034A                 Matrix       : WATER
Ext Btch ID: VA39A13                  % Moisture    : NA
Calib. Ref.: EA19031A                 Instrument ID : GCT039
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	86	65-135

RL : Reporting Limit

Handwritten: 1/21/06

4013

METHOD 5030B/M8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/17/06
Project     : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/20/06 08:20
Sample ID   : 86-S14-082                 Date Analyzed: 01/20/06 08:20
Lab Samp ID : A085-10                    Dilution Factor: 1
Lab File ID : EA19035A                   Matrix       : WATER
Ext Btch ID : VA39A13                    % Moisture    : NA
Calib. Ref. : EA19031A                   Instrument ID : GCT039
=====

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PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	.1	.02

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
BROMOFLUOROBENZENE	88	65-135

RL : Reporting Limit

8/17/06 4014

LDC #: 14645A7

SDG #: 06A085

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 2/17/06

Page: 1 of 1

Reviewer: AS2nd Reviewer: AS**METHOD:** GC TPH as Gasoline (EPA SW846 Method 8015B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	Δ	Sampling dates: 1/16 - 1/17/06
IIa.	Initial calibration	Δ	
IIb.	Calibration verification	Δ	ICV ≤ 15
III.	Blanks	Δ	
IVa.	Surrogate recovery	Δ	
IVb.	Matrix spike/Matrix spike duplicates	Δ	
IVc.	Laboratory control samples	Δ	LCSD
V.	Target compound identification	Δ	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	Δ	Not reviewed for Level III validation.
VII.	System Performance	Δ	Not reviewed for Level III validation.
VIII.	Overall assessment of data	Δ	
IX.	Field duplicates	SW	D = 5, 4
X.	Field blanks	ND	TB = 1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-083 TB	11	86-S14-078MS	21		31	
2	86-S14-074	12	86-S14-078MSD	22		32	
3	86-S14-075	13	MBLK1W	23		33	
4	86-S14-078	14		24		34	
5	86-S14-079 P	15		25		35	
6 ^T	86-S14-080** P	16		26		36	
7	86-S14-081	17		27		37	
8	86-S14-076	18		28		38	
9	86-S14-077	19		29		39	
10	86-S14-082	20		30		40	

Notes:

LDC #: 14645A7
SDG #: 06A085

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JA
2nd Reviewer: JA

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 14645A7
SDG #: 06A085

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: BJ
2nd Reviewer: BJ

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field duplicates?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Were field blanks identified in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were target compounds detected in the field blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

LDC #: 14645A7
SDG #: 06A005

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: B
2nd Reviewer: A

METHOD: GC HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = $100 \cdot (S/X)$
A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported		Recalculated		Reported		Recalculated	
				CF (100% std)	CF (100% std)	Average CF (Initial)	Average CF (Initial)	%RSD	%RSD		
1	ICAL	12/8/05	gasoline	13505	13505	12810.6	12810.6	5.7	5.7		
2											
3											
4											

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14645A7
SDG #: 06A085

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = $100 \cdot (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (Ical)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	ave	1/20/06	gabapentin	500.0	445.21	11	445.21	11
	44.06							
	5.48							
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14645A7
SDG #: 06A085

METHOD: GC HPLC

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer: JS
2nd reviewer: Y

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS \times 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #6

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
BFB	DB-5	40	40.08	100	100	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 5
2nd Reviewer: 7

GC HPLC

The percent recoveries (%R) are calculated using the following calculation:

$$\% \text{Recovery} = 100 * (\text{SSC} - \text{SC}) / \text{SA}$$

SSC = Spiked concentration

SA = Spike added

MS = Matrix spike percent recovery

$$RPD = (((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD)) * 100$$

MS/MSD samples: 11 & 12

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		Matrix spike		Matrix Spike Duplicate		MS/MSD	
	MS	MSD		MS	MSD	Reported	Recalc.	Percent Recovery	Recalc.	Reported	Recalc.
Gasoline (8015)	0.5	0.5	ND	0.422	0.454	84	84	91	91	7	7
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for details.

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

GC HPLC

[illegible]

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Moffett Air Field, UST Site 14, CTO 86
Collection Date: January 16 through January 17, 2006
LDC Report Date: February 21, 2006
Matrix: Water
Parameters: Volatiles
Validation Level: EPA Level III & IV
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 06A085

Sample Identification

86-S14-083
86-S14-074
86-S14-075
86-S14-078
86-S14-079
86-S14-080**
86-S14-081
86-S14-076
86-S14-076DL
86-S14-077
86-S14-082
86-S14-078MS
86-S14-078MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990.

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Initial calibration verification (ICV) percent differences (%D) were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
86-S14-076	Benzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 86-S14-079 and 86-S14-080** were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	86-S14-079	86-S14-080**	
Benzene	31	31	0

XVII. Field Blanks

Sample 86-S14-083 was identified as a trip blank. No volatile contaminants were found in this blank.

Moffett Air Field, UST Site 14, CTO 86
Volatiles - Data Qualification Summary - SDG 06A085

SDG	Sample	Compound	Flag	A or P	Reason
06A085	86-S14-076	Benzene	J (all detects)	A	Compound quantitation and CRQLs

Moffett Air Field, UST Site 14, CTO 86
Volatiles - Laboratory Blank Data Qualification Summary - SDG 06A085

No Sample Data Qualified in this SDG

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 03:07
Sample ID: 86-S14-083                 Date Analyzed: 01/24/06 03:07
Lab Samp ID: A085-01                 Dilution Factor: 1
Lab File ID: RAQ494                   Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                 Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

2004

Handwritten signature/initials

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 03:43
Sample ID   : 86-S14-074             Date Analyzed: 01/24/06 03:43
Lab Samp ID : A085-02                 Dilution Factor: 1
Lab File ID : RAQ495                 Matrix          : WATER
Ext Btch ID : V005A44                 % Moisture       : NA
Calib. Ref. : RLQ208                 Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-DB	104	75-125

RL: Reporting Limit

2005

Handwritten: 1/27/06

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC      Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.    : 06A085                 Date Extracted: 01/24/06 04:19
Sample ID    : 86-S14-075             Date Analyzed: 01/24/06 04:19
Lab Samp ID  : A085-03                 Dilution Factor: 1
Lab File ID  : RAQ496                  Matrix          : WATER
Ext Btch ID  : V005A44                 % Moisture       : NA
Calib. Ref.  : RLQ208                  Instrument ID    : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-DB	104	75-125

RL: Reporting Limit

2006

2/21/06

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 04:55
Sample ID: 86-S14-078                Date Analyzed: 01/24/06 04:55
Lab Samp ID: A085-04                 Dilution Factor: 1
Lab File ID: RAQ497                 Matrix      : WATER
Ext Btch ID: V005A44                % Moisture   : NA
Calib. Ref.: RLQ208                 Instrument ID : T-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	105	75-125

RL: Reporting Limit

2007

2/21/00

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC          Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.    : 06A085                     Date Extracted: 01/24/06 07:19
Sample ID    : 86-S14-079                 Date Analyzed: 01/24/06 07:19
Lab Samp ID  : A085-05                    Dilution Factor: 1
Lab File ID  : RAQ501                     Matrix          : WATER
Ext Btch ID  : V005A44                    % Moisture      : NA
Calib. Ref.  : RLQ208                     Instrument ID   : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	31	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

2008

2/7/06

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 07:56
Sample ID: 86-s14-080                Date Analyzed: 01/24/06 07:56
Lab Samp ID: A085-06                 Dilution Factor: 1
Lab File ID: RAQ502                  Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                  Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	31	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	94	65-135
BROMOFLUOROBENZENE	105	75-125
TOLUENE-D8	108	75-125

RL: Reporting Limit

2009

2/27/06

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

=====

Client : TETRA TECH EC, INC	Date Collected: 01/16/06
Project : UST SITE 14, MFA, CTD 86	Date Received: 01/18/06
Batch No. : 06A085	Date Extracted: 01/24/06 05:32
Sample ID: 86-S14-081	Date Analyzed: 01/24/06 05:32
Lab Samp ID: A085-07	Dilution Factor: 1
Lab File ID: RAQ498	Matrix : WATER
Ext Btch ID: V005A44	% Moisture : NA
Calib. Ref.: RLQ208	Instrument ID : T-005

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	101	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	103	75-125

RL: Reporting Limit

2017

2/21/06

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client       : TETRA TECH EC, INC           Date Collected: 01/16/06
Project      : UST SITE 14, MFA, CTO 86     Date Received: 01/18/06
Batch No.    : 06A085                       Date Extracted: 01/24/06 10:22
Sample ID:   86-S14-076                     Date Analyzed: 01/24/06 10:22
Lab Samp ID: A085-08                         Dilution Factor: 10
Lab File ID: RAQ506                           Matrix       : WATER
Ext Btch ID: V005A44                         % Moisture    : NA
Calib. Ref.: RLQ208                         Instrument ID : Y-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	770E J	10	2
TOLUENE	39	10	2
ETHYLBENZENE	15	10	2
XYLENES (TOTAL)	120	30	5
MTBE	ND	10	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
BROMOFLUOROBENZENE	108	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2018

2/21/06

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC          Date Collected: 01/16/06
Project     : UST SITE 14, MFA, CTO 86    Date Received: 01/18/06
Batch No.   : 06A085                     Date Extracted: 01/25/06 11:08
Sample ID   : 86-S14-076DL               Date Analyzed: 01/25/06 11:08
Lab Samp ID : A085-08T                   Dilution Factor: 250
Lab File ID : RAQ547                     Matrix          : WATER
Ext Btch ID : V005A47                   % Moisture       : NA
Calib. Ref. : RLQ208                     Instrument ID    : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	8200	250	50
TOLUENE	ND	250	50
ETHYLBENZENE	ND	250	50
XYLENES (TOTAL)	ND	750	120
MTBE	ND	250	50

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
BROMOFLUOROBENZENE	109	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2019

2/21/06

SW 5030B/8260B
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/17/06
Project     : UST SITE 14, MPA, CTO 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 06:08
Sample ID: 86-S14-077                Date Analyzed: 01/24/06 06:08
Lab Samp ID: A085-09                 Dilution Factor: 1
Lab File ID: RA0499                  Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                  Instrument ID : Y-005
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	102	65-135
BROMOFLUOROBENZENE	107	75-125
TOLUENE-D8	104	75-125

RL: Reporting Limit

2020

2/21/06

SW 50306/82608
VOLATILE ORGANICS BY GC/MS

```

=====
Client      : TETRA TECH EC, INC      Date Collected: 01/17/06
Project     : UST SITE 14, MFA, CTD 86 Date Received: 01/18/06
Batch No.   : 06A085                 Date Extracted: 01/24/06 06:43
Sample ID: 86-S14-082                Date Analyzed: 01/24/06 06:43
Lab Samp ID: A085-10                 Dilution Factor: 1
Lab File ID: RAQ500                  Matrix       : WATER
Ext Btch ID: V005A44                 % Moisture    : NA
Calib. Ref.: RLQ208                  Instrument ID : T-005
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
BENZENE	ND	1	.2
TOLUENE	ND	1	.2
ETHYLBENZENE	ND	1	.2
XYLENES (TOTAL)	ND	3	.5
MTBE	ND	1	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
BROMOFLUOROBENZENE	111	75-125
TOLUENE-DB	105	75-125

RL: Reporting Limit

2021

2/21/09

LDC #: 14645A1

SDG #: 06A085

Laboratory: EMAX Laboratories, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 2/17/06

Page: 1 of 1

Reviewer: 2nd Reviewer: **METHOD:** GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	Δ	Sampling dates: 1/14 - 1/17/06
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	Δ	RRF non spec
IV.	Continuing calibration	Δ	ICV ≤ 25 ↓
V.	Blanks	A	
VI.	Surrogate spikes	Δ	
VII.	Matrix spike/Matrix spike duplicates	Δ	
VIII.	Laboratory control samples	A	LCS 1P
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Δ	
XI.	Target compound identification		Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	SW	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III validation. not Reported
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	Δ	
XVI.	Field duplicates	SW	D = 5 + 6
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	86-S14-083 TB	11	86-S14-082	21	MBLK1W	31	
2	86-S14-074	12	86-S14-078MS	22	MBLK2W	32	
3	86-S14-075	13	86-S14-078MSD	23		33	
4	86-S14-078	14		24		34	
5	86-S14-079 D	15		25		35	
6	86-S14-080** D	16		26		36	
7	86-S14-081	17		27		37	
8	86-S14-076	18		28		38	
9	86-S14-076DL	19		29		39	
10	86-S14-077	20		30		40	

LDC #: 14645A1
SDG #: 06A085

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of > 0.990 ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were all percent relative standard deviations (%RSD) $\leq 30\%$ and relative response factors (RRF) > 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) $\leq 25\%$ and relative response factors (RRF) ≥ 0.05 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 14645A1
SDG #: 06A085

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl chloride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Methyl ethyl ketone	FFF. 1,3-Dichlorobenzene	XXX. Di-isopropyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropene	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethene	SS. 1,3-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	CCCC. 1-Chlorohexane
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein
M. 2-Butanone	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropene	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methylacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL.

* = System performance check compounds (SPCC) for RRF; ** = Calibration check compounds (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and CRQLs

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

Were compound quantitation and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/> N	<input type="checkbox"/> A
--	---------------------------------------	----------------------------

[illegible]

Comments: See sample calculation verification worksheet for recalculations

LDC #: 14645A1
SDG #: 06A085

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: A
2nd reviewer: V

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A
Y N N/A

Were field duplicate pairs identified in this SDG?

Were target compounds detected in the field duplicate pairs?

Compound	Concentration (<u>ug/L</u>)		RPD
	<u>5</u>	<u>6</u>	
<u>✓</u>	<u>31</u>	<u>31</u>	<u>0</u>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 1464SA
SDG #: 06A085

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$$RRF = (A_s)(C_u)/(A_u)(C_s)$$

average RRF = sum of the RRFs/number of standards
%RSD = $100 * (S/X)$

A_s = Area of compound,
 C_s = Concentration of compound,
 S = Standard deviation of the RRFs
 X = Mean of the RRFs

A_u = Area of associated internal standard
 C_u = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (10 std)	RRF (10 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	1CAL	12/8/05	Methylene chloride (1st internal standard)	1.592	1.592	1.635	1.635	3.79	3.79
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14645A1
SDG #: 06A0085

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
RRF = $(A_s / C_s) / (A_i / C_i)$
Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
 A_s = Area of compound, A_i = Area of associated internal standard
 C_s = Concentration of compound, C_i = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	RA0489	1/24/06	Benzene Methylene chloride (1st internal standard)	1.635	1.814	10.9	1.814	10.9
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichloroethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14645A1
SDG #: 06A085

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: B
2nd reviewer: Q

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 6

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	10	10.83	108	108	0
Bromofluorobenzene	↓	10.52	105	105	↓
1,2-Dichloroethane-d4	↓	9.43	94	94	↓
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 1464SA1
SDG #: 06A085

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Recovery} = 100 * (SSC - SC) / SA$$

Where: SSC = Spiked sample concentration
SA = Spike added

SC = Sample concentration

$$RPD = |MSC - MSDC| * 2 / (MSC + MSDC)$$

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 12 + 13

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)		Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	MS	MSD	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene												
Trichloroethene												
Benzene	10	10	nd		10.8	10.8	108	108	108	108	0	0
Toluene	10	10	↓		10.7	10.7	107	107	107	107	0	0
Chlorobenzene												

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

Where: SSC = Spiked sample concentration
SA = Spike added

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: Y005A44/C

[illegible]

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14645A1
SDG #: 06A005

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1
Reviewer: B
2nd reviewer: O

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y/N/N/A	Were all reported results recalculated and verified for all level IV samples?
Y/N/N/A	Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_B)(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_s = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. # 6, Benzene

Conc. = $\frac{5983940 \text{ } 10}{1190128 \text{ } 1635}$
= 31 ug/L

[illegible]